

Flight, August 17, 1912.

FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

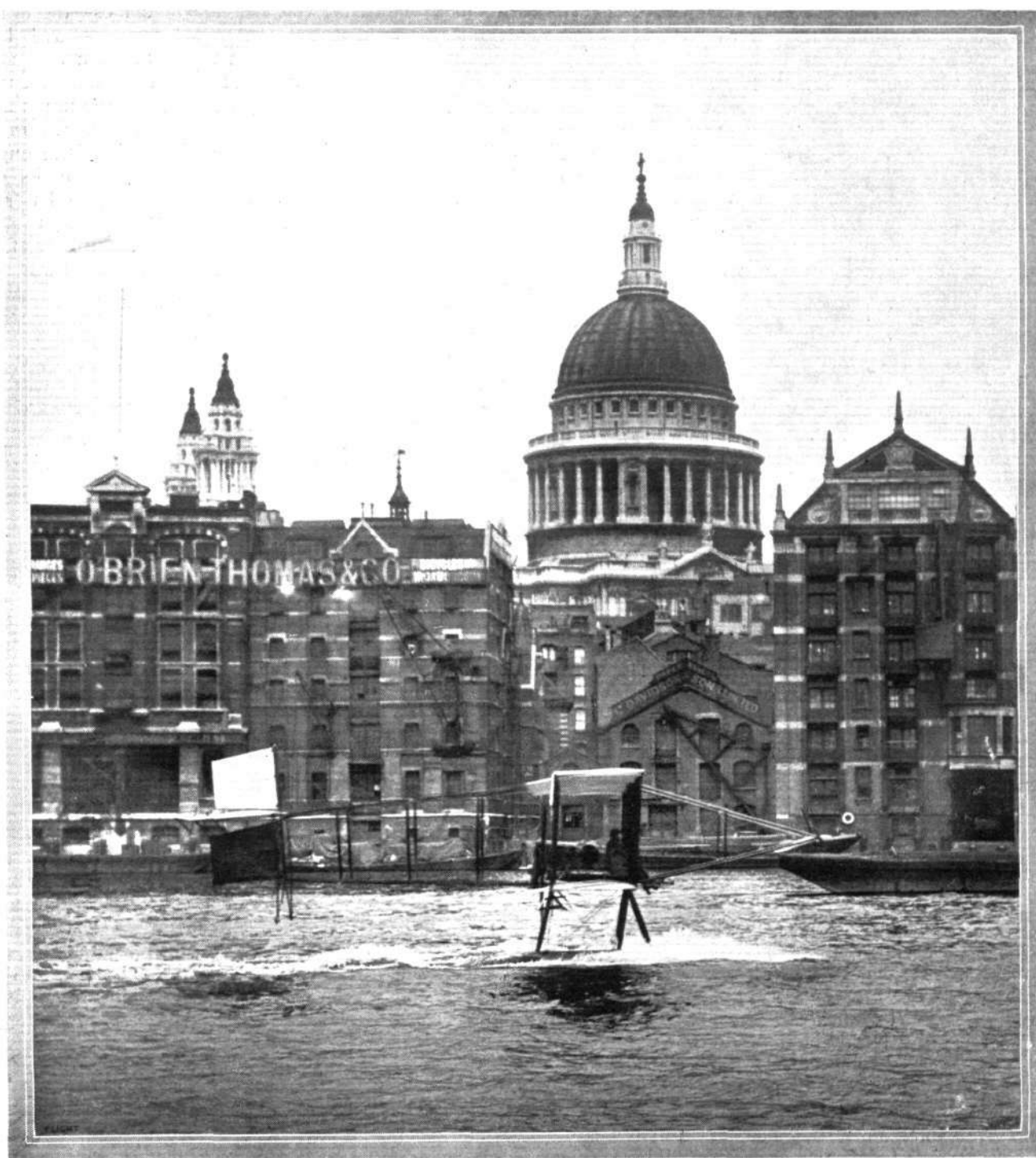
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WITHIN SIGHT OF ST. PAUL'S.—Mr. Frank K. McClean on his Short hydro-aeroplane on Sunday last. Mr. McClean, on his machine, is seen passing the point on the Thames at St. Paul's Cathedral, he keeping to the surface of the water owing to the restrictions of the police authorities, to which special regulations must, in a measure, be attributed the mishap which Mr. McClean suffered when, lower down the Thames, he endeavoured to take to the air at the point indicated by the police authorities.

EDITORIAL COMMENT.

The Military Trials.

Although, at the time of writing, the Military Aeroplane Trials are far from completed, quite enough data are already available to make a study of the results to date well worth while. It may, perhaps, be useful if we attempt to summarise the points that stand out from the general mass of information, and in the first place, we would urge recognition of the principal fact, namely, that the number of machines engaged in the trials and their wide diversity of type renders the occasion a unique opportunity from which *should* evolve what may well be termed a world's record in data upon which to base sound conclusions upon the science and practice of dynamic flight.

From the very inception of the trials we have had this consideration in mind, and have made to the best of our ability, a serious attempt to do justice to it through the medium of our technical editor's report and analysis of the Trials, which is distinct from the general report of the day-to-day happenings. Not the least valuable feature of this report, we hope, is the table that has been compiled in an endeavour to set forth the data in a manner that should enable students to follow both the facts and their scientific significance with comparative ease. It is not by any means our habit to dwell upon our own work, but in this case we cannot help saying that we really think that it will pay the serious student of flight to read, mark and inwardly digest the lessons that this table is capable of conveying.

Now, with regard to the more general aspects of these Trials, there is one point upon which we think it is desirable to insist at the outset. That point is that the Trials are essentially tests of war machines as opposed to aeroplanes for commercial or pleasure use. Having laid this down as our starting point, we venture to think that some of the entrants have lost many a brilliant opportunity of impressing the authorities with the capabilities of their machines. True, the weather conditions have been exceptionally bad, but we have seen the spectacle of a whole Flying Corps staff waiting and watching in vain for flights which while not in the nature of observed tests, would nevertheless have impressed the army authorities with a sense of what may be called the weatherliness of the modern aeroplane. Let it be well understood that we do not for a moment suggest that undue risks should be taken, but there is a difference between taking what are really legitimate risks and staying in the hangars with an obvious idea that prizes rather than orders for machines were the main object in view. If in the month of August, a sequence of ten days can produce but 38 hours of official flying weather, it most obviously supplies an argument for the sceptical to maintain that, after all, the aeroplane is nothing but a fair weather machine, unless it makes a very determined attempt to take the air. This, we know, is not in accordance with the facts, but what it is eminently desirable to avoid is anything which can give colour to the idea that the aeroplane can only be of service in calms or light winds.

The exigencies of war will not wait upon weather and, we repeat, it is *war* machines which are being tested.

It is the poor impression that may be conveyed, which leads us to give expression to this stricture, and not any doubt in our own mind as to the actual capabilities of the machines. Some of them are not ready even now, while others have been deterred by the necessity of passing the three hours' test before proceeding to the other events

from going aloft in doubtful weather. If the bad weather continues, it might assist matters to permit competitors to make their gliding tests, speed tests, landing, &c., in any order that is convenient, the recognition of the results therein being, of course, subject to the subsequent completion of the three hours' flight. After all, it would be very useful to have some definite information to go on with about as many machines as possible.

Let us now come to the consideration of the lessons to be gathered from the figures to date. It is almost dropping into a platitude to say that the first essential of an efficient aeroplane is a reliable engine. Nevertheless it is a point that must be noted as one of the principal lessons of the trials for at least two machines—the Martin Handasyde and the Coventry Ordnance—have been prevented from doing anything at all as a consequence of a serious motor defect. In the direction of engine improvement, the next point that arises is the importance of the relation of fuel to oil consumption. From the table, it will be seen how far is the aeroplane engine from the economy of the ideal car motor in its consumption of lubricating oil. In the case of the latter the ratio is about 25 to 1, a figure that, by these trials, is only approximated by the big Austro-Daimler motor fitted to the Cody biplane. In the Gnome, the ratio is seldom better than four to one and the oil required is of a special kind, which might seriously affect the utility of the machine if there were any difficulty in obtaining supplies.

A point to which considerable importance seems to be attached by the military authorities is that of variable speed and in this connection it is interesting to note such performances as that of the Cody, the slow speed of which can be increased by nearly fifty per cent. and which, at its fastest, can fly nearly as fast as the fastest monoplane. But here the significance of power and a big engine is apparent, wherefore we have tried, as explained last week, to analyse the data by the aid of a new constant X which combines the factors of weight per h.p. and weight per sq. ft., on the assumption that they are analogous to the weight and gear ratio of a motor car.

Everyone will be interested to see the gliding figures and to note how closely they approximate to the one in six required, which, it was often said, would be a most difficult figure to attain. The figures are especially interesting because, so far as they go, they fail to give any appreciable advantage to either type of machine; in a word, it looks as if the moderate speed of the biplanes had found its equal in the streamline monoplane bodies. Now that these figures are available, as well as those of the climbing tests, it is possible to get some idea of the overall efficiency of the aeroplane. Exact figures are impossible for reasons explained in the text, but the figures serve as a comparison and, indeed, in all our conclusions we are rather concerned with stimulating discussion and presenting a comprehensive view of different aspects of the Trial than with any desire to dogmatise mathematically.

In conclusion, let us say a word of appreciation of the military authorities who are conducting the Trial. Up at four o'clock in the morning, no matter what the weather, keenly attentive to every detail, knowing exactly what they want and how to get it, pleasant and kindly to all and sundry, they have made the Trial absolutely business-like and practical to a degree and a pleasure to all who have had to take part in it.

THE MILITARY COMPETITIONS.

By Our Technical Editor.

WHAT THE DAYS HAVE BROUGHT AND WHAT THE MACHINES HAVE DONE IN THE MILITARY TRIALS.

Salisbury Plain, Sunday, August 11th.
IN the balmy air and soul-inspiring sunshine of a perfect Sabbath morn, it is difficult to believe that the weather should have been so

bad as to keep things almost at a standstill through the week. Monday was wet and windy, so was Tuesday. Wednesday toned down in the late afternoon to a state in which several competitors



THE MILITARY AEROPLANE COMPETITIONS.—Some of the pilots who have been flying at Salisbury. On the right at the top is a portrait of the late Mr. Fenwick who was fatally injured on Tuesday.

succeeded in doing their wind tests. Thursday saw a little flying before breakfast, and a little more for the edification of Members of Parliament in the afternoon. Friday was the only really good day of the week, and caught some of us napping after a series of 4 a.m. *reveilles*, which hitherto had persistently turned out to be false alarms. Saturday, of which everyone expected great things, was not fine for long enough to arouse dejected spirits into even an interest in the impending freedom of a curtailed week-end.

Taking things all round, there has been a fair amount of flying of sorts and that of a skilled and highly interesting order, but there has not been as much as might reasonably have been expected to evolve from so many nests, where, upon inspection, far too great a number of birds are still unfledged. A genius who wrote of these doings, "and the Army also flew," was right, but the *also* deserved italics. Without Capt. Hamilton and his *Dep.*, Lieut. Barrington-Kennett and his Nieuport, Major Brooke-Popham and his Avro, and others who must excuse absence of names, but whose flights helped to draw that line under the "also," the aquatic aspect of the occasion might well have had a greater ascendancy over the aerial than was happily the case.

There is no doubt that some of the competitors whose machines are ready to fly—and we really must distinguish between the factories and the sheds—are so obsessed by the spirit of "competition" that they fear to go out for a test unless the elements are wholly in their favour. If this were a trade competition in the ordinary sense of the term, that is to say an event in which the prize is everything and the effect of actual performance nothing, such precautions would be good generalship and open to no criticism in the absence of a recognised sporting element. Here, however, the competitive aspect of the occasion is but a secondary consideration to anyone who is really trying to build up a business in army flying machines. A prize may be worth having and a very good advertisement, but it would be worth a lot more to a good many constructors if they were to take more pains to profit by the opportunity to show their paces before the undivided attention of General Henderson and the other officers, who, for the most part, have had to kick their heels on the wet plain from 4 in the morning till 8 at night. Not that *they* have not plenty to do in work of their own that keeps them busy enough, but there they are, willing and ready to watch anything that will fly, and when all of them are practical

pilots themselves, it must stand to reason that they have at least as much interest in the evidence of their own eyes as in that of a mere instrument, which may serve to place some particular aeroplane 1st, 2nd or 3rd in the prize list. Yes, humbly spoken, we would say that those who reckon they can fly at all in this weather would do well to worry less about marks and more about effect. Not a judge in the trials but would rather endure a thunderstorm on the plough to see a flyer make a forced descent in the worst conditions, than sunshine on the plain while a "prize winner" waits for the wind to shift two points of the compass that it may blow him along the furrow. Aeroplanes are made to be used, as we have often enough remarked, and though one may get tired of this platitude, it is better to be tired of that than to grow weary of waiting for the aeroplane itself to fly.

Opportunity counts, of course, for a very great deal both in the event and in the actual after service of the aeroplane, for which reason those men and their machines who have lost no chance to push ahead with the tests deserve all credit. Take the French "*Dep.*" flown by Prevost, for instance, it is already finished and the pilot himself returned to Paris. What is the effect thereof on the spectator's mind; none other, of course, than that the machine and the man are about as fine a combination as ever got off the face of the globe. Three hours, fast and slow speed, landing on plough, climbing, gliding and road transport, all were over on Saturday, and Prevost's last flight was to take Commander Paine for a jaunt in the "high seas," whence he returned with a good appetite for tea. Previously, General Henderson had also had a flight with Prevost. These two went off to compare notes, doubtless to the advantage of both man and machine, for both have won the hearts of all.

There are two British-built "*Deps.*" and one French-built in the trials, but the difference in design is not appreciable although the weights are somewhat different. A characteristic feature of the undercarriage on the French *Dep.* is the use of diagonal fore and aft struts, between the upright, on each side of the A frame, which are carried out and upturned to form skids. These, and the triple mast on each side of the cockpit, render the machine easily recognisable in the air.

At the opposite end of the machine, the tail affords an interesting feature by possessing a marked camber although fin-like in plan form. Its area, 55 sq. ft., also that of the elevator, flaps and rudder, is large.

Six wires to each spar are used above and below for trussing the wings, but there is an extra wire to the end of the front spar from the back of the skid, which with the other wire ordinarily present on machines of this type forms a triangle to produce a resultant in a truly vertical plane. The ordinary wires slope forward a little, being attached to the front ends of the skids, but their slope is hardly such as would make them drift wires in the ordinary sense.

It is notable that the wing tips of this machine have no apparent "washout" when at rest, nor do they appear to flatten in flight; although I have heard some pilots state that they do so. Mr. Koolhoven, the works manager of the Deperdussin factories, however, says that not only is the apparent camber maintained, but that he favours a school machine with a well defined curve on the wing tips, which is curious as most people appear distinctly to favour the flattened plane if not the negative angle at the ends of the wings.

Other machines well forward are the Aircraft Co.'s Maurice Farman flown by Verrier, and the Blériot No. 4, which is in the hands of Perreyon. Of both one naturally expects a great deal, both being such well-known machines, yet how different they are in design. Perreyon's monoplane No. 4 is the Blériot's "sociable," in which pilot and passenger sit side by side, and although a later type than the tandem design there are several pilots who express a preference for the latter arrangement in these machines, and, in general, prefer the characteristics of the design of No. 5: some even going so far as to say that it has a higher degree of natural stability in flight. In a discussion on the subject one evening—these things are apt to be discussed when wise men would be abed and asleep for the good of their health—an interesting point arose as to the effect of the vertical area presented by surfaced bodies to a side wind, particularly as to the couple that might be set up tending to slew and cant the machine. It is obvious that any vertical surface aft of the centre of gravity would produce such a slewing couple in a side wind and swing the machine off its course, and it is reasonable to suppose that such a tendency may be balanced by that part of the body-surface forward of the c.p. if the extent of the fabric on the backbone is suitably adjusted. In this case a side-gust merely produces drift without loss of direction, and it was suggested that the difference in the stability of the two machines, if any, might be an example of the above principle. It is, at any rate, noticeable that the Blériot tandem has an open backbone for a part of its length, whereas the "sociable" type is completely covered in, and



Brigadier-General D. Henderson, Director of Military Training, War Office, and (on the left) Capt. Godfrey M. Paine, Commandant of the Central Flying School, making a tour, as judges, of the aeroplanes in the Military tests at Salisbury.

whether or no the problem has any application in this case, there is no doubt that it is an interesting point to consider.

Similarly, too, must one be prepared to regard the influence of vertical surface above and below the centre of pressure, which tend to produce a couple in a side wind that might cant the machine. Rudder torque is conceivably an influence on stability in this way; that is to say a rudder surface wholly above or below the longitudinal axis will give rise to a twisting movement that will tend to increase or diminish the natural bank at a turn. Turning with a rudder wholly above the axis, its torque about the horizontal axis tends to reduce the bank and *vice versa*.

Yet another consideration in connection with backbone and tail design is the possible shielding effect on the rudder of a surfaced backbone when the path of the machine is not truly axial. By this I mean that if the machine drifts or descends while it is flying in a normal horizontal attitude there may be a tendency for the backbone and fixed tail plane to shield or, as it has been expressed, "stream-line" the rudder and elevator flaps. Experience will teach more on these points, but having regard to the prevalence of machines with surface backbones and to the occasional evidence of machines having failed to respond to their control, although subsequent investigation has proved that there has been no mechanical derangement, there is a suggestion that this is particularly a point worthy of the attention of pilots. An open lattice work girder, as on the Blériot tandem, should facilitate the free flow of air in oblique directions through it. Alternatively, it is to be noted that the elevator flaps of some machines in the trials, as for instance the Coventry Ordnance, are carried well outside the extremities of the tail plane.

In judging the performances of the Blériot No. 4 so far as they are complete it must be admitted that they are wonderfully near the figures stated in the requirements laid down in the rules. Thus aeroplanes must do at least 55 m.p.h., and if this figure has any significance in itself it finds a good place in the speed range of the Blériot, which flew from 52 to 61.5 m.p.h. on test.

There is an extreme neatness of finish about the modern Blériot workmanship, not only in the main members of construction, but also in respect to minor detail. The bolts that fasten the guy wires to the lugs on the wing spars, for instance, are chained to the cable so that they cannot be lost. It is the same with the split pins also. In the tandem model, stranded wire cables replace the steel ribbon formerly used for the guys. Wires of much greater strength than before are used for the top staying, as the result of M. Blériot's famous memorandum to the French Government on the subject of top pressure. On the under cables, an adjustment is provided at the anchorage to the undercarriage, which makes for facility in assembling the machine and particularly in changing a damaged wing. Interchangeability has, in fact, become standardised in modern Blériot construction. In the "sociable" type, No. 4, the horizontal tail is a fin extending from the surfaced backbone and having hinged elevator flaps. On the tandem monoplane, No. 5, the tail plane is cambered and carries load; it is mounted beneath the girder as on the original Cross-Channel machine.

Quite the most remarkable feature of the flying of the Maurice Farman, apart from general excellence as to steadiness and easy action and manoeuvrability at slow speeds, is its extraordinary gliding attitude. Instead of putting its nose down on to the sloping path, it keeps apparently level and seems to settle in the air in a manner that has given rise to the application of the expression "pancaking" in this connection. Pancaking, we might mention, originally meant falling flat on the chassis in a clumsy landing, and the Farman certainly does not do that, for all its large size it is a most graceful flyer, particularly at slow speeds when its manoeuvrability is delightful to watch. Timed in the slow test, the speed was reduced from its maximum of 55.2 m.p.h. to 37.4 m.p.h., which is scarcely more than half the velocity for which some of the machines are designed in normal flight. Happily this aeroplane has an engine that is worthy of it—which is more, apparently, than can be said of all the motors present—for the 70-h.p. Renault, once it has been properly tuned up, seems to give the utmost satisfaction in its performance of the work. Moreover, it seems to suit the machine admirably.

The features of the Maurice Farman, which is now British built by the Aircraft Co., are too well known to need description, but the long skids that are extended to carry the elevator, form its distinctive external characteristic of the design, and are always worthy of comment, because they so obviously turn the forward portion of the elevator to account in the evolution of a safe landing chassis. The Farman type machines belong to the true biplane type, which has, there is some reason to believe, large sail area as its chief feature of importance. True, one could hardly ignore the second plane of a small area biplane, or do otherwise than classify it as belonging to the same general type of machine as the Maurice Farman, but there is certainly a very vital difference between the biplanes that attempt

to follow the monoplane principle of high loading, and those of the old school that seek efficiency in climbing power by having only a very moderate number of pounds to the square foot. If the Maurice Farman weighs 2,000 lbs., or thereabouts, in flight, it has 700 square feet wherewith to carry it, so the loading is less than 3 lbs. per square foot. No wonder it glides as if gently settling down in the air without any apparent change of attitude, for there is no very great difficulty about getting the effective velocity under the planes that is required to produce the lift requisite for the mere support of the machine in the air. To say that the machine does not glide, but "pancakes," is a description that is graphic enough but hardly to the point, unless the old significance of the term in relation to the occasional descents of beginners in the art of aviation, is lost sight of altogether. The manoeuvre is a glide right enough, but whether Verrier may not exaggerate the flat attitude a little is another matter. If he does, it is not likely to be of any useful account in improving the gliding angle, which is solely determined by least resistance, in which speed and attitude are merely incidental factors.

This machine, has, of course, the propeller between the planes and the tail, so that the pilot and observer sit tandem in a small protected body, well forward, where they get a wonderfully good view in all directions.

The climb for 1,000 ft. was accomplished in 4 mins. 50 secs., which, for a weight of 2,000 lbs., represents 12.6-h.p. expended, or 18 per cent. of the total engine power available.

By Sunday the Hanriot No. 2 was also well forward, likewise the Cody. In flight, the characteristic of the Hanriot is its projectile-like ascent and its extraordinary speed. It is difficult to see the speed of an aeroplane in flight, but once I happened to be driving in a motor car alongside the Hanriot when it was going all out and low down over the speed course. The effect was remarkable; I can only describe it as a solid body flowing swiftly through space. A twist in the road and the imminent proximity of the ditch distracted my attention from the aeroplane to the car—but it is ever thus at an aviation meeting where the driving on the high roads is not less wonderful than the flying in the air.

The Hanriots (Nos. 1 and 2) are alike in design, and both monoplanes are characterised by an extreme simplicity due to the complete enclosing of the rectangular bird-like body and to the symmetry of the upper and lower stay wires. There are but eight cables to each



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Interested spectators of the flying on the Plain.—On the left, Mr. Mervyn O'Gorman, Superintendent of the Royal Aircraft Factory. On the right, Major-General Sir C. F. Hadden, K.C.B., Master-General of the Ordnance.

wing, two above and two below each spar. All are steel cables, and those above take their anchorage on a tripod mast above the pilot's cock-pit. Both pilot and passenger sit tandem in the same cock-pit, the pilot in front having a view over the leading edge of the wings. The massive simplicity of the undercarriage, which is a good example of the A frame, also adds to the general effect of sturdiness; a detail of interest on this part of the machine is the bell crank lever device for gearing up the warp so as to increase the wing movement for a given deflection of the lever. It is a particularly neat machine, and looks robust and rigid, as distinct from the slender build of some monoplanes. Its design is evidently efficient as a type of low head resistance, for although a 100-h.p. Gnome is used, it is well known that this is a very high rating, and allowance for this is necessary when recognising the flying speed of 75 m.p.h.

To the Cody in these trials, acknowledgment is first due to the fact that it is in all essentials the original type that first flew at Laffan's Plain. Cody may not be a scientist in mathematical theory, but in practical aeroplane construction he is a genius, and in his method of experiment he does what few geniuses do, which is to evolve a basic design to the limits of its capacity, by eliminating one by one, the unknown factors in its design. Too many men drop a design when it is not perfect at once. Cody, on the contrary, has exhibited the perseverance of a hero, and he deserves to succeed, as indeed he does, for the machine is as handy in the air as if it were a little single-seater instead of a great 'bus that will carry four or five people. It is fast, very fast for a biplane of that size, and it can climb well, although at the moment of writing its proper timed ascent has not been measured. Its speed-range is excellent (the slow test showing 48.5 m.p.h., and the fastest 72.4 m.p.h., *i.e.*, the difference is 23.9 per cent. of the maximum, and nearly 50 per cent. of the minimum) and is in any case far ahead of anything yet achieved in this particular test in these trials.

It is impossible for any engineer seriously to study Cody's biplane and not give the designer credit for a wonderful lot that escapes the casual eye. Cody has "made good" and if he had had the engine he has got on his machine now at the Bournemouth meeting, he would have astonished the flying world before others came to make good flying a commonplace occurrence. The present machine is practically the same: divided elevator in front, twin cross tail behind; both carried on bamboo booms. The 120-h.p. Austro-Daimler engine drives a twin-bladed propeller through a twin roller chain at 7 to 4 gear ratio.

Among the little points of great interest are the arched planes, which are also slightly reduced in the gap at the extremities. In

flight with full power, the front spar is about an inch and a-half lower than the back spar, so that the planes fly at a very small angle.

The large elevator, it is always important to remember, is divided, and warps in harmony with the main planes. The landing chassis is quite remarkable, and time and again has proved its durability and use for landing on bad ground. Almost any part of the machine could be repaired by a blacksmith, which is, or might be, a most useful consideration in war.

Salisbury Plain, Monday, August 12th.

Sunday's good weather being maintained on Monday morning, the Amesbury and Larkhill Camps were on the field by 4 a.m., and before breakfast the entire aspect of the trials was changed by a sequence of performances accomplished under official observation. No fewer than four machines, Hanriot No. 2, Blériot No. 4, Maurice Farman and Cody, finished off all tests except road transport, which should be a mere incident in to-day's further proceedings, while Hanriot No. 1 got a good start with the successful accomplishment of the three hours' flight.

Busteed on the Bristol monoplane No. 14 also really set the ball rolling for the British and Colonial Co. by flying for his three hours' qualifying test and ascending at the same time to over 4,500 ft. Most of the flight was accomplished at over 2,000 ft. and if any pilot deserves credit for a single effort it certainly is Busteed for his endurance and perseverance in this. In the first instance, his engine misfired more or less persistently, but he pushed on up to 1,800 ft. before it got into its regular beat. Many pilots would have come down, and as pilots are only human, even when flying, I have a sympathetic regard for his sticking to the job. Most of the time, too, the observer was wandering about in the forward cockpit "on reconnaissance bent," and being uncommonly impressed with the machine's stability would now and then stand up, lean over the side or sit on the back of the seat—anywhere, in fact, but where the designer put him. Among other little accomplishments, he marked the wings with a pencil where he would like a little more material cut away for a peep hole, and generally kept Busteed busy in what spare time he could find from the mere manœuvring of the machine, but the machine did not seem to mind in the least. In flight, the tail of this monoplane is so high that the least change of course immediately gives rise to the impression that it is about to descend.

That this monoplane flies well, is a fact, but, with all deference, it seems extraordinarily interesting to me that the Bristol monoplanes should fly at all, seeing that they were designed and built inside three months, have never previously been tried, belong entirely to a class of their own and are, besides, built so close to the limit of calculated values (this does not refer to materials or strength, but to aerodynamic factors) that a very slight mistake either in the designer's figures or the constructor's sizes would have kept them on *terra firma* altogether. No man in the aeroplane industry has more confidence in himself than Coanda, and he has loaded his machine up to the hilt. It is cutting things fine for a new design in a trial of this importance, and the risk is greater because there are factors involved that make it difficult to ensure that the inherent merits of the machine shall be given a fair show by the pilot.

Take the gliding question that is on everyone's lips, for instance. According to the design of the machine, the pilot is expected to do something no pilot ordinarily attempts and few of experience have the inclination to try, namely, to make no attempt to put the head down by the aid of the elevator at the commencement of a *vol plané* descent. The argument is that the machine takes its natural angle automatically by reason of the tilting action of the couple produced by the centre of gravity and centre of pressure, which is released from the restraining force of the tail when the propeller draught ceases to blow on the negative angle elevator. Hence, any positive augmentation of this effect on the part of a pilot who puts his elevator over to a positive angle, is likely to promote a *vol piqué*, and an unexpectedly rapid descent.

There has been some question as to whether this machine would assume its natural gliding attitude on cutting off the motor, but the evidence of this morning's flight suggests that the c.p. c.g. couple effects its purpose quite well in keeping the tail up when the propeller draught drops. This is not extraordinary, for the loss of v^2 under the wings will certainly cause an instantaneous descent, which for the moment will increase the angle of incidence and cause the position of the c.p. to retreat; it is quite possible for this increased leverage to more than compensate for the reduced force, thus increasing the couple and slightly raising the tail. When the machine regains its proper velocity and attitude again, the conditions resume their normal state.

These machines carry between 9 and 10 lbs. per sq. ft. of surface, which, while not unknown, is at least unusual, and nearly 50 per cent. more than most monoplanes. Its value for X is enormous, for the machine flew about 1,900 lbs. in the trials, and the 100-h.p. Gnome is notoriously over-rated. In a word, it is the highest-geared flyer for its weight in the competition, and nothing, so far as we know, except the 100-h.p. Nieuport even comes into its class.



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Mr. G. de Havilland, on the left, who, on Monday last, ascended in the R.A.F. biplane BE 2 to a height of 9,500 ft., beating the British record for altitude. Walking with him on the right is Major F. H. Sykes, who accompanied him as passenger during the flight.

The work of the designer, M. Coanda, inspires all with the greatest respect for his skill, knowledge of the subject and enthusiasm for his work. He has had to produce a machine in record time, and it is one of the best-built and soundest machines, from an engineering point of view, that we have seen, besides showing every evidence of being a good flyer.

In our correspondent's report of the proceedings last week, reference was made to a landing by Pixton on the Bristol biplane, which was said to have broken a chassis strut. Actually, the pilot was Gordon England, and the mishap limited to the radius-rod fastening coming adrift from the timber.

In the speed trials this morning, the Cody biplane averaged 72.4 m.p.h., which must be very nearly a biplane record for the world, and is in any case a splendid performance having regard to the fact that the fastest monoplane at these trials did only 75.4 m.p.h. and that the Cody biplane couples with its own celerity through the air a wonderful ability to travel slowly when there is need to do so. It has, in fact, an effective range of 30 m.p.h. difference in speed between its slowest and fastest velocities of flight.

This and de Havilland's splendid high flight on the R.A.F. "BE2," which is also a British biplane record, caused Monday morning to be a red letter occasion in these trials, but as the good weather was not maintained during the day nothing of any importance took place later, except that the Blériot No. 4 completed its tests by undergoing its road transport behind the six-year old Thornycroft car that Mr. Strickland has so generously placed at everyone's service for every type of business. Quite apart from the fact that the motor car engine has been the forerunner of the aero motor, the necessity of having first evolved the motor car before proceeding to the development of the flying machine becomes strikingly apparent at any aviation meeting of this sort. Distances are great and the need for rapid movement oftentimes most urgent, and it is then that a trusty machine that can go over any sort of country and carry any sort of load assists one so much to follow events with intelligence and to be somewhere near the right spot at the right time.

FLIGHT SPEED AND ITS MEASUREMENT IN THE MILITARY TRIALS.

THE speed tests pure and simple in these trials are measured by stop-watch, the machines being flagged as they pass over white lines that have been permanently laid down on the Plain for that purpose.

Not high speed alone, but range of speed is required of the military aeroplane, and in consequence each competitor has to fly twice with and against the wind, as fast as he can and as slow as he dare. In the former, a speed of at least 55 m.p.h. must be attained to avoid disqualification; in the latter, there is no limit save that of safety. There is no doubt, from all accounts, that the authorities regard the capacity for variable speed as a merit of high value. This is, of course, an important factor from the constructor's point of view, because of the characteristics that variable speed implies. We shall know more about the facts of the case when the weather has been so kind as to allow a few more machines to perform this test; but, from theoretical considerations, it would seem as if the capacity for variable speed is mainly bound up in the question of surplus power, as indicated by the magnitude of our constant X, explained last week.

A machine that can fly slowly and fast must either have plenty of sail area, and the means of pushing it through the air at a high speed when necessary, or the power necessary to fly tail down to the limit of safety. Probably, the method that will produce the slowest speed of all is to fly with the tail right down and the engine all out, but it is scarcely commendable on the score of safety, and for this reason it would seem as if very heavily-loaded planes have an inherent disadvantage in this matter, just as has a motor car with a very high gear ratio, when it is called upon to perform a similar feat without slipping the clutch.

There is, indeed, an apparent analogy between the gear ratio of a motor car and the loading of the wings of an aeroplane, which fits in very well with the general purpose of the constant X, which, as will be remembered, consists of the product of loading (lbs. per sq. ft.), and weight per horse-power. Weight lifting in itself is no merit unless the weight is appropriate to the class of machine required by the purchaser, as is, for instance, demonstrated by the fact that any ordinary lorry could win a hill-climb against touring cars on a formula that put a premium on the weight carried. Conversely, high-gear ratio, or loading in the case of an aeroplane, is not necessarily meritorious in itself, as may again be instanced by the fact that the typical racing car is a notoriously awkward machine to use for average touring, because, notwithstanding its immense power, it can so easily be overloaded by a reasonable weight.

In an aeroplane, a reduction of the weight carried in flight automatically reduces the loading of the wings and the corresponding speed of flight necessary to the support of the machine in the air; which dual effect renders it more reasonable to arrive at the

Salisbury Plain, Tuesday.

Another cold and windy morning—really the climatic conditions on Salisbury Plain attain the maximum of eccentricity—has again interrupted the sequence of events and for the present issue of FLIGHT there remains nothing but to bring our account to a temporary conclusion by briefly referring to the machines that have not already come under prominent notice. The Vickers No. 3 appears to be troubled with a misfiring engine, but has made several flights unofficially. The Breguet is also in trouble with its engine and has so far only succeeded in making a kind of glorified hop. Coventry Ordnance, with two machines and one pilot, have been somewhat limited in the scope of their activities on this account and have besides had considerable trouble with the Chenu motor. In the Bristol camp, Gordon England has taken over the Biplane No. 12 and would have been out for his three-hour flight on Monday morning had the engine consented to start. The other Bristol biplane is for the moment without a pilot, Pixton having been transferred to the monoplane vacated by Valentine, who has left. The Flanders monoplane has been without its engine, which has now just arrived, and the Martin Handasyde monoplane has been flying admirably, and notably in winds, under the expert control of Gordon Bell, during the intervals that are not occupied with repairing the magneto drive, which appears to be an inherent weakness of the Chenu engines as at present built. The Aerial Wheel, the Handley Page and the Piggott machines are still in process of their assembly test. The Mersey with its 45-h.p. Isaacson came out on Friday morning and again on Sunday evening and those who saw it say that it was quite strong on the wing.* Now that the French Dep. is through its tests, the two British Deps. will come into the field, Mr. Santoni, the British representative, and M. Koohlhoven the works manager, having shown excellent management in concentrating all efforts on the proper attendance on one machine at a time.

* As we go to press, news arrives of the sad fatality that is recorded elsewhere.

constant X, by multiplying the two factors (loading and weight per h.p.) instead of adding them together.

At the moment of writing there is but little data about actual speeds to discuss. The Hanriot, which happens so far only to have been tried for fastest pace, stands highest in speed, with 74.6 m.p.h.; and the French Dep. second, with 69.1. Then comes the Blériot No. 4, with 61.5 m.p.h., and the Aircraft Co.'s Maurice Farman,



M. Louis Blériot and Mr. Norbert Chereau, the Blériot representative for Great Britain, watching the flying on Salisbury Plain.

with 55.2 m.p.h. Cody, who also went for his speed trial, unfortunately broke a valve-tappet pin, which put one of the cylinders out of action, and thus added resistance at the same time that it reduced the power. Unofficially, he attained 72 m.p.h. before the breakage, and kept going at 69 m.p.h. afterwards. There is a practical lesson in the value of variable speed in this little mishap, which might befall any flyer while engines are what they are, and always must be while man makes them.

In the matter of officially-stated speed ranges, the Maurice Farman slowed down to 37.9 m.p.h., which represents a drop of 32 per cent. from its fastest speed. The Blériot was able to fly at 52 m.p.h., *i.e.*, to lose 14.6 per cent., and the French "Dep" to fly at 59 m.p.h., which represents exactly the same percentage variation. It depends, of course, on whether the 55 m.p.h. required under the rules represents the maximum or the minimum speed actually necessary to the army, as to the relative significance of having a speed range wholly below that figure, as in the Farman, or wholly above it, as in the French "Dep." In any case, the magnitude of the range of the Farman is both significant and interesting; it has a very large sail area of 700 sq. ft., a very small loading (*i.e.*, is low geared) of 2.86 lbs. per sq. ft., but carried 28.6 lbs. per h.p. with a 70-h.p. Renault. Its value for *X* is, therefore, 81.7, which compared with others in the table implies that it has plenty of power in hand, notwithstanding its relatively small engine and the large size of the machine. Unofficially, Cody did 55 m.p.h. slow speed, or a reduction of 23.6 per cent. on the maximum. The best result in the test under good conditions should be distinctly instructive.

There is one important point to be noted in speed trials relating to the measurement of mean speed, which is to calculate the mean of means and not the mere average resulting from the total time. Considerable inaccuracy results if this is not attended to, because, if the wind is blowing appreciably, the actual time during which the

machine is travelling up wind over the 3,000 yards course is longer than the time for the same distance down wind. In the limit, a 60 m.p.h. machine flying against a 60 m.p.h. wind never gets there at all; the time is infinite, and the calculated speed is *therefore* zero, whatever the time down wind may have been. The correct process is to calculate the speed up wind and the speed down wind separately for each journey, and to take the mean of these figures as the true speed of the machine. It is *not* correct to add together the times and calculate on the total distance.

An interesting incident of Cody's speed-trial was that the observer, Lieut. Bettington, actually made speed calculations while flying on the machine, by using a stop-watch and a 6-in. slide-rule. The result was written down in the note-book, also while flying, and ready to hand to the judges as soon as the machine had come to rest.

On Monday morning when Cody again ran for speed he put up a maximum of 72.4 and a minimum of 48.5 m.p.h., which is a truly remarkable range, as it represents 33.2 per cent. decrease and 49.4 per cent. increase on the fast and slow speeds respectively. The high speed itself, too, is something of a record character for a biplane of this kind.

There is a general impression among pilots that altitude influences absolute velocity, and it would really be an extraordinarily interesting thing to have some data on this point, for the idea has taken firm root, and although there does not seem to be any readily available explanation of the phenomenon, nevertheless, it by no means follows that the idea is absurd. Discussing this matter, among others, one evening, Mr. Strickland advanced much interesting information relating to the behaviour of boats in shallow and deep water that does indeed give colour to the suggestion that the absolute depth of the medium may influence the speed of objects moving in it, but at this point, for the moment, we must let the matter rest.

HOW THE GLIDING ANGLE IS MEASURED IN THE MILITARY TRIALS.

THE gliding angle, or least average slope at which the machine approaches the ground from a height, with its engine switched off, is measured automatically by an instrument carried on the machine—on the observer's lap, to be precise, for it is a rather large box, and there is no necessity to fix it in any particular position. The purpose served by the apparatus inside the case is to ascertain two sides of a right-angled triangle from which the third can be calculated, and the triangle thus constructed represents graphically the performance of the machine. The vertical side corresponds to the altitude at which the engine was switched off, the base represents the horizontal distance travelled while gliding, while the hypotenuse corresponds to the slope of the path of gliding descent. Thus, the triangle is a record of essential results.

In the "Trajectorygraph"—as this instrument has been named by the Royal Aircraft Factory officials who evolved it—the two things

actually measured are the speed of flight through the air down the sloping path, and the rate of vertical fall or descent of the machine that results from flying down the slope. The former is measured by a Pitot tube attached to one of the wings, the latter by a barograph contained inside the instrument case.

A Pitot tube consists, fundamentally, of two tubes placed side by side, one of them having its open end pointing into the wind, while the other has an orifice at the side into which the wind cannot blow. They are both connected to the same instrument, and the object of the second tube is to correct the first by differentiating between the pressure that is due to velocity and that due to the static state of the atmosphere. In this way a really accurate measurement of speed through the wind can be obtained, provided that the instrument is calibrated for each machine; for this reason, it was necessary that each aeroplane about to undergo a gliding test should also make a timed flight over the speed course either just before or just after the glide. The Pitot tube is fixed to the front edge of the wing, about the middle of the spar, so that it projects forwards. The barograph for measuring the altitude consists of a simple vacuum flask suitably coupled up to a gauge, from which a record can be obtained of the relative altitudes throughout a range of equal intervals of time.

The gauge and recording apparatus have the clever simplicity and practical utility that characterise instruments designed by men who have to make use of their own handicraft. The gauges are alike, both being of the differential-tube kind, in which small variations in pressure in a bulb cause magnified displacements of a coloured fluid in a narrow tube. Benzine and methyl alcohol serve as the two non-mixing fluids that are essential to the proper operation of such gauges, and after much experiment a mixture of dyes was obtained that stains one of the liquids a brown colour, while it leaves the other liquid clear. This particular dye also has the advantage that it does not make the glass blotchy, and the gauge is, in fact, quite the cleanest and the clearest reading of its kind that we have seen.

An automatic record of its indications is obtained photographically by projecting the shadow of the dark liquid in the gauge on to a strip of bromide paper that is drawn at a uniform rate behind the gauge by means of a small electric motor. Time interval dots are simultaneously marked on the record by a pencil that is controlled by clockwork, but one rather amusing and very interesting accidental discovery that was made in first trying the instrument was that the current used by the pencil mechanism temporarily dimmed



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FLYING AT THE ARMY COMPETITIONS IN A 25-MILE WIND.—Verrier, on the Aircraft Co.'s Maurice Farman, passing over the sheds.

the electric lamp that projects the shadow, and thus caused a white vertical line to appear across the face of the record itself. Thus, except for purposes of extreme accuracy, the pencil dots are unnecessary, the record being automatically divided into sections representing equal time intervals.

The shadows of the two gauges are projected on the same paper, but each is quite distinct, because their overlap appears as a region of darker tone. As, however, the gauges necessarily stand a little apart, simultaneous readings of speed and altitude do not appear on the same ordinate, but on ordinates that are displaced from one another by a fixed distance, depending on the design of each individual instrument.

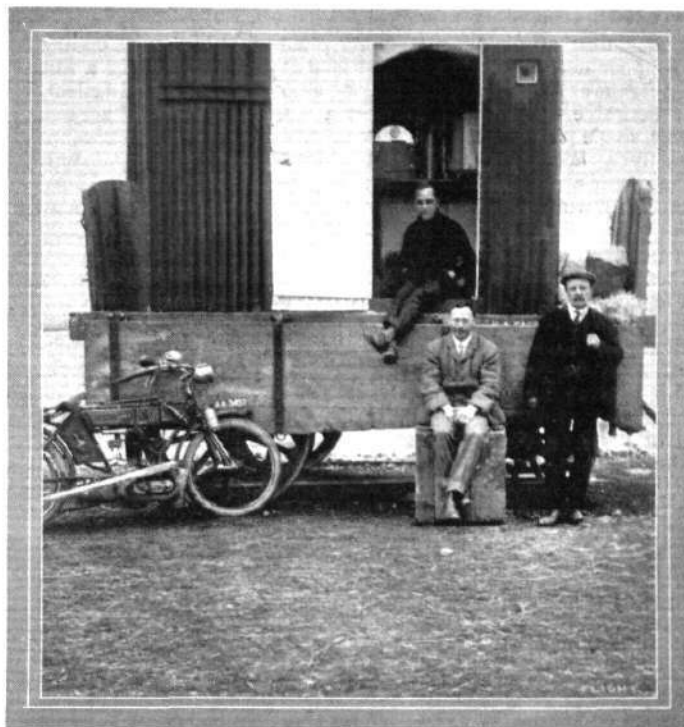
A record from the "Trajectograph" is an extraordinarily fascinating document, for it shows almost the very thoughts that were passing through the pilot's mind. Just before the glide commences, you may find a little place on the curves of speed, indicating where the machine was accelerated in velocity, and any other manœuvre of a similar character is faithfully recorded.

As the instrument measures rate of fall and rate of travel, it cannot be deceived by any dodging in the wind, and it would not matter in the least if a machine on a windy day came down on the same spot over which it commenced its descent. Its glide *through the wind* would still be recorded, and would be just as much to its credit, probably more so, as if it had travelled a mile or more over the ground. In *Flight Manual*, p. 237, there are some gliding diagrams that may interest those who are not quite clear as to the effect of wind on this manœuvre. It is, of course, necessary to accuracy, that the wind should be horizontal, but in the place where the test is made, and in the winds that are likely to prevail when it is made, the existence of a positive air velocity is no bar to an accurate observation of the gliding angle with the "Trajectograph."

In the design of this instrument, several of Mr. Mervyn O'Gorman's assistants at the Royal Aircraft Factory have had a hand, but they all agree that most credit in the matter is due to Mr. F. Short, who, with Mr. E. T. Busk, is in charge of a field instrument station, christened Trajectograph Villa, on Knighton Down, that would still be worthy of scientific aeronautics had the new arm been already established in military field service for several years. Appreciation of the practical and useful work performed by the R.A.F. and the National Physical Laboratory is none too general, but there is no doubting the facts and small use denying the credit all the same.

From the figures alone available at the moment of writing, a specified glide of nearly one in six appears to have been more readily attained than many, including myself, thought probable. Especially is it interesting to note the fact that the monoplanes as well as biplanes have approximated the desirable minimum, and that the former machines belong essentially to the high speed order.

Although the observation of the gliding angle of the machine affords an inclusive measurement of the resistance to motion obtaining under the circumstances, yet there are various factors that somewhat militate against the direct application of the figure in question to the conditions of normal flight. One factor of importance, for example, is the question of the influence of the propeller, which if turning freely in the air certainly offers less resistance than when it is at rest. Then again, the gliding velocity is certainly less than the flight velocity, for two reasons: one because the gliding velocity is no more than is required to maintain the machine in its attitude of least resistance, and the other because the load actually



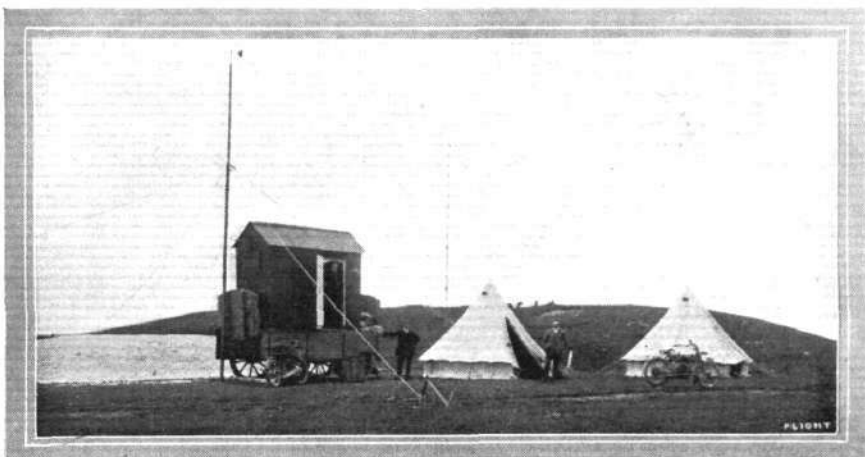
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The instrument cabin at "Trajectograph Villa," on Knighton Down, with Mr. E. T. Busk (sitting on the box) and Mr. F. Short (sitting on the floor) of the Royal Aircraft Factory, who are in charge of this scientific work at the Military Aeroplane Competition. Mr. F. Short deserves great credit in connection with the design of the very clever instrument—the trajectograph, which is used for measuring the gliding angle of the machines. Part of the instrument in question shows as a patch of white on the shelf above Mr. Short's head.

supported by the wings is no longer the total weight of the machine, but a smaller quantity obtained by multiplying by the cosine of the gliding angle. Thus, the speed through the air necessary to obtain the requisite dynamic support may be appreciably less than obtains under normal conditions of flying.

These considerations would be of small moment were the machine to consist of the wings alone—and those capable of flexing to suit the velocity of flight—for, theoretically, the resistance to the flight of wings that do this is independent of speed. In practice, the wings are fixed, the attitude of the machine is only variable within certain limits, and there is an altogether extraneous head resistance due to the pressure on the body, struts and wires. These latter members, at any rate, are by no means uninfluenced by the factor V ; indeed, the resistance to which they give rise obeys some function of the V^2 law. It is, therefore, not altogether easy to deduce from the gliding angle precisely what is the tractive effort required in normal flight, and even at the risk of being accused of labouring a point I must again refer to BE 2, which has its propeller mounted on a sliding sleeve fitted with a stiff spring so arranged that it can move forwards a little in proportion to the thrust exerted and thereby communicate the pull to a recording instrument through the agency of a forked lever that rides against the boss. By this means the R.A.F. succeed in knowing exactly the resistance of their machine in flight, and it is no longer a matter of opinion when they come to the conclusion that any particular change in strut or wire has reduced or increased the head resistance in flight.

Notwithstanding the limitations to accuracy, it is still interesting to construct a figure for power expended in flight by multiplying the thrust deduced from the gliding angle by the maximum flight speed obtained in the speed test. The product has the dimensions of power, but its quantitative value, as explained above, is doubtful. One thing, however, seems to me reasonable—namely, that the tractive effort required at this high speed is not less than the resistance deduced from the gliding velocity, and that, in any case, the advantage of having



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"Trajectograph Villa" on Knighton Down, where Messrs. F. Short and E. T. Busk, of the R.A.F., are in charge of the scientific work connected with the trials. Trajectograph is the name given by them to the instrument that automatically measures the gliding angle when it is carried on the machine in flight.

good gliding angle (apart from its practical utility in extending the field for descent in emergency) is that it may result in a fast speed for the expenditure of a moderate amount of power. In effect, it is desirable to ascertain whether a machine that has a good gliding angle *because* it flies slowly, can also turn it to account when flying fast. On this basis, Hanriot No. 2 shows 64 per cent. of the power available (in this case the 100-h.p. Gnome is reckoned at 80-h.p.) when flying all out. Similarly, the Maurice Farman shows 45 per cent. and the French Dep. 68 per cent. The Cody is 61 per cent. and the Blériot 74 per cent.

These results are related to propeller efficiency and indirectly to the constant X, and it will afford, when the table is complete, means of ascertaining whether the constant in question is likely to be of any service in the field of its intended purpose, which purpose has already been fully explained last week. A high value for X implies that the designer claims a high efficiency for his machine, and a low value that he has a great deal of surplus power in hand, or else a machine of poor design. In the table of figures this week the French Dep., for example, has a higher value for X than the Maurice Farman No. 22, and it has shown a higher percentage efficiency on the calculation aforementioned. On the other hand, the Hanriot No. 2 has claimed a little more in the way of efficiency than the Dep., but has materialised a little less. Precisely the same order results from applying the constant X to the percentage power demonstrated in climbing.

Now, although too much store must not be set by these figures, nor is it other than ridiculous to commence generalities as to class distinctions on the evidence of so few machines, yet there is an aspect of this investigation that raises a point worthy of thought and discussion on the part of those who are seriously interested in these matters. As a generalisation, the biplane with its large sail area is often spoken of as inherently efficient, while in the table the only figures available tend to point the other way. By efficiency, let me be clearly understood to mean nothing save the ratio of the power manifested to the engine power available. Efficiency is a much abused term, and the above being its proper meaning in engineering, this discussion is more for the purpose of suggesting that the

expression is apt to be misapplied to biplanes in general, when what is really meant is a capacity for flying with small engines and manoeuvring with safety at low speeds.

Arising out of the question of efficiency proper, however, there is indeed a consideration of some importance to be borne in mind when we see so many biplanes nowadays being built on what, for lack of a better description, I can only call monoplane lines. By this, I do not mean external appearances or even constructive detail, but rather the less obvious, but in some ways more important, distinction that is governed by the factors of weight per horse-power and loading, which are summed up in the constant X. The question arises whether the appropriate value of X for biplanes as a class is not lower than can be justified by the typical monoplane. In a word, it becomes a matter of some importance to ascertain whether the incidental features of biplane construction—from which such machines derive their meritorious points such as strength and reduced stress values—can be combined advantageously with the high loads and “gear ratio” (loading) that may successfully characterise the typical monoplane. If it can be shown that the biplane as a class, with its gap and its struts, is inherently as efficient, in the true sense of the term, as the monoplane with its scientifically reduced head resistance, then there is no reason why a biplane should not be designed for the same high value of X as any monoplane that is built. On the other hand, if the reverse is in reality the fact, then would it seem to be improper to attempt to do so. And, here let me point out, once more, the significance of what this means, in order that it may not be misunderstood. It is not to say that, if the latter of the above alternatives proves true, the biplane is other than the very useful machine that it has already proved itself to be, and, more so, is becoming every day. On the contrary, its significance, if true, will be to point out that biplane construction represents a genuine class distinction in flying machine design, and that the designer will succeed best therein who studies the characteristics of the type, and seeks not to copy the heavy loading of the wings which the monoplane has, apparently, the inherent efficiency to support.

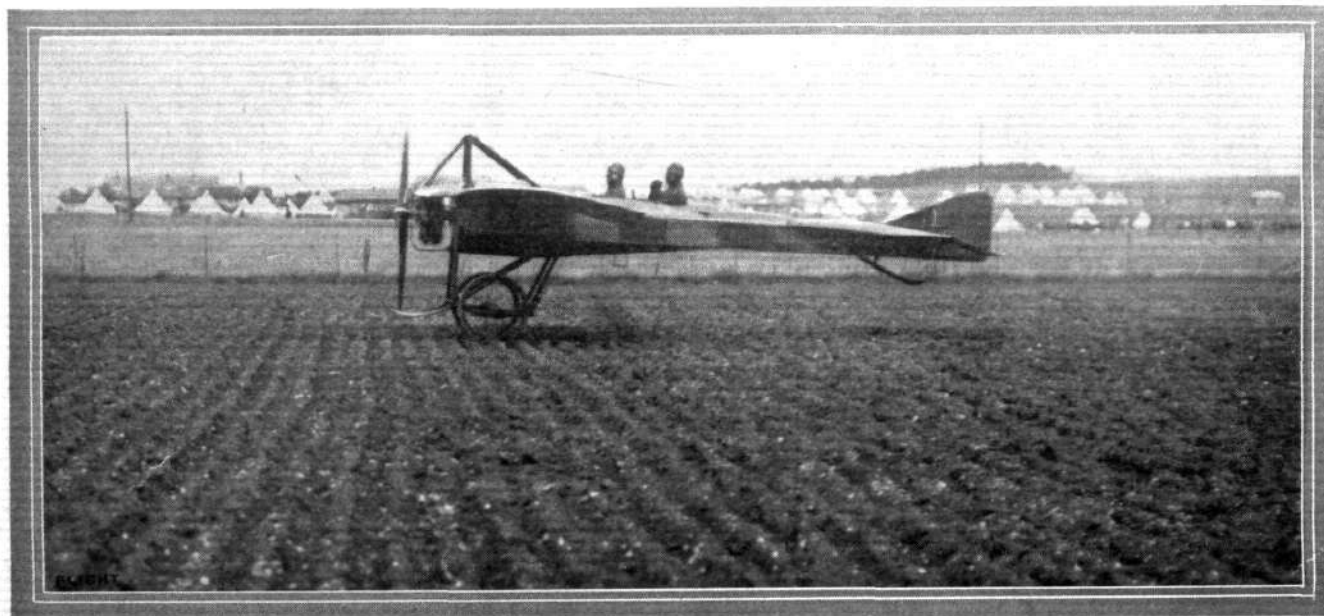
THE TABLE OF RESULTS AND WHAT IT HAS TO TELL.

CONSIDERING the labour involved in the preparation of the table this week—and my slide rule is perceptibly slacker for all the work it has done lately—it is a pity that there is not more to show in the way of results. There is, nevertheless, sufficient to indicate that these trials are likely to afford a record amount of information about aeroplanes, and it is to be hoped that those interested in the use and design of such machines will give the data the study that it so well deserves. On the whole, figures do not appeal very strongly to most people, but there are some in this table that ought to interest everyone, and especially would I ask those who find any inaccuracies to communicate the necessary corrections, so that the particulars may be set right in a future issue. In the compilation of this table, it has been sought to produce a compact record that

shall be in keeping with the importance of the occasion, and it should be very useful in future to be able to refer to it for the data that it should subsequently afford when it is complete.

For the moment it gives scarcely more than an indication of the scope of the trial and the interesting nature of the facts and figures arising therefrom. Already, however, two or three machines have provided numerical quantities that serve as some indication of the figures that are likely to obtain. Thus, all three gliding angles that are at present available are better than the specified “one in six.” These glides are the best figures obtained, but as the variation is small in each case, it seemed only fair to give the machines credit for such excellent performances.

Some notes on the application of the gliding angle and the



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Prevost and his observer in the French Deperdussin, just landed in the ploughed field test in the Army competitions.

MILITARY AEROPLANE TRIALS. RESULTS UP TO AUGUST 12th.

[In all calculations the corrected h.p. is used instead of the maker's h.p. when there is any difference.]

No.	Name.	h.p.	Motor.	Pilot.	Corrected h.p.	Cu. ins. per h.p.	Weight.	Weight ÷ h.p.	Area.	Weight ÷ area.	$X = \left(\frac{W}{H.P. \times A} \right)$	Petrol.			Oil.		Ratio. Petrol : oil.	Climbing 1,000 ft.	3 hours.	Speed.				Plough.	Stopping.	Wind.		Gliding.				With climb added.	Finished.		
												In tank.	Per hr.	Per h.p. hr.	In tank.	Per hr.				Fast.	Slow.	Increase.	Decrease.			Maximum.	Minimum.	Slope.	Thrust.	Power at max. velocity.	Per cent.				
							lbs.				X	gals.	gals.	pts.	gals.	gals.	m. s.	h.p.	%		%	%	yds.	m.p.h.	m.p.h.	One in	lbs.	h.p.	%	%					
1	Hanriot	100	Gnome	Bielovucic	80	12.0	1500	18.8	269	5.77	108	42.5	8.0	.72	12.1	2.4	3.3	2.45	15	18.8	yes														
2	Hanriot	100	Gnome	Sippe	80	12.0	1500	18.8	269	5.77	108	41.0	8.65	.78	11.2	2.1	4.2	3.0	15	18.8	yes	75.4	66.6	11.7	13.2	yes	119		5.9	255	51.4	64.2	83.0		
3	Vickers	70	Viale	McDonald					220																										
4	Blériot	70	Gnome	Perreyon	60	11.3	1536	25.6	198	7.75	198	27.0	5.35	.61	8.2	1.7	3.15	4.0	6.5	9.2	yes	61.1	52.0	14.9	17.5	yes	60	28	15	5.6	274	44.6	74.3	85.1	yes
5	Blériot	70	Gnome	Perreyon	60	11.3						27.0	6.3	.72	9.5	1.7	3.77	4.0			yes														
6	Avro	60	Green	Parke	70	7.8	1800	25.7	335	5.38	138																								
7	Avro	60	ABC	(engine not ready)																															
8	Breguet	110	C.U.	Moineau	7.2	2150	19.5	465	4.62		90																								
9	Breguet	110	C.U.	(not arrived, owing to accident while flying from France)																															
10	Coventry	100	Gnome	Sopwith	80	12.0	1950	24.4	350	5.44	133																								
11	Coventry	110	Chenu	Sopwith			2050	20.5	300	5.83	110																								
12	Bristol Bi.	100	Gnome	England	80	12.0	2326	29.0	387	6.0	174																								
13	Bristol Bi.	70	Mercedes	(not flown)			5.5	2296	32.7	387	5.92																								
14	Bristol Mon.	80	Gnome	Busteed	75	9.6	1970	26.2	210	9.5	249	39.0	8.0	.85	8.0	1.7	4.7	5.0	11.9	15.8	yes					31	15								
15	Bristol Mon.	80	Gnome	Pixton	75	9.6	1970	26.2	210	9.5	249																								
16	Flanders	100	ABC	(engine not ready)			2000	20.0	400	5.0	100																								
17	Martin H.	75	Chenu	Bell	95	6.9	1800	24.0	310	5.8	110																								
18	Aerial Wheel	—	NEC	(not arrived)																															
19	Mersey	45	Isaacson	Fenwick			1150	25.6	400	2.9	74																								
20	Brit. Dep.	100	Gnome	Vedrine	80	12.0	2000	25.0	270	7.4	185																								
21	Brit. Dep.	100	Anzani	Porte		7.5	2000	20.0	270	7.4	148																								
22	Aircraft	70	Renault	Verrier	72	5.9	2000	27.8	700	2.9	80	35.0	7.0	.78	3.5	.73	9.75	4.50	12.5	17.3	yes	55.2	37.4	32.2	47.6	yes	64	29	14	6.8	220	32.3	45	62.3	
23	Kny...	100	Mercedes	(not arrived)																															
24	Lohner	120	A.-D.	(not arrived)																															
25	Weston H.	—	—	(not arrived)																															
26	French Dep.	100	Gnome	Prevost	80	12.0	1596	20.0	315	5.1	102	38.5	8.4	.75	7.2	1.3	6.3	3.0	16.1	20	yes	69.1	59.0	14.6	17.1	yes	73	29.5	13	5.4	296	54.5	68.0	88.0	yes
27	French Dep.	100	Gnome	(not arrived)			1400	14.0	248																										
28	Handley P.	70	Gnome	Petre	60	11.3	1450	24.2	240	6.1	148																								
29	Piggott	35	Anzani	Parr		5.9	700	20.0	100	7.0	140																								
30	Cody Mon.	120	A.-D.	(not arrived, damaged in previous flight)																															
31	Cody Bi.	120	A.-D.	Cody		5.9	2150	18.0	500	4.3	77	42.0	9.0	.6	4.2	.42	21.4	3.30	18.6	15.5	yes	72.4	48.5	33.2	49.4	yes	27	14	5.6	384	74.0	61.5	77.0		
32	Borel	80	Gnome	(not arrived)	75																														

N.B.—No. 6 was damaged, but is under reconstruction. Nos. 8, 11 and 17, engine trouble delays progress. No. 19 has been wrecked. Nos. 20, 21 purposely delayed, to assist No. 26 to finish. Nos. 28, 29 under construction. Nos. 12, 15, pilots only appointed on August 12th.

Summary of Performances.

		X	V	R	H	G	E ₁	E ₂
Monos.	Blériot	198	61	17	11	5.6	74	85
	Hanriot	108	75	13	19	5.9	64	83
	Dep.	102	69	17	20	5.4	68	88
Biplanes	Cody	77	72	49	15	5.6	61	77
	Farman	80	55	47	17	6.8	45	62

The accompanying table summarises some of the results achieved by the machines that are furthest forward in the trials, but it is subject to correction, owing to the absence of exact weights; also, the Cody has not flown for its proper ascent. In the column-headings:—X is the product of weight per h.p. by weight per sq. ft., and a high value implies a claim for high efficiency. V is the maximum flight speed obtained. R is the speed range expressed as percentage increase on the slow speed. H is the percentage h.p. used for the height climb. G is the best mean glide. E₁ is the ratio of V-times the resistance deduced from the gliding-angle to the effective h.p. available. E₂ is E₁ plus H.

Blériot claims a high efficiency under X, and scores under E₁. Notice must be taken of the proximity of the Blériot values to the figures specified in the rules: as implying a class, such agreement, in the light of the table, signifies skilful design. The Hanriot is designed for more reserve-power than the Blériot, having a smaller value of X, and makes good under E₂. Credit should be given for its good gliding-angle, since it has facilitated a high speed. The Dep., with a steeper gliding-angle, is designed for more reserve-power (lower X), and, by overcoming resistance by force, it scores under both E₁ and E₂. It also deserves credit for its speed range. Of the two biplanes, the gliding-angle of the Cody is the same as that of the Blériot; it scores heavily in speed, but only moderately in the climb—for which it has not yet been properly timed. It is designed for a large reserve of power and should climb much faster than the rate now on record. The Farman has the best gliding-angle, which naturally diminishes the value under E₁, unless it is accompanied by a very high speed. It appears to be designed for a fair reserve of power, but, apparently, the head resistance is considerable at high velocities. In common with the Cody, its great forte is speed-range, for which both machines deserve great credit. Like the Blériot, it is designed close to the specified figures.

deductions is to be made from it, appear elsewhere in this issue. In an adjacent column in the table, the gliding angle is converted into thrust, and the thrust into a figure of horse-power by multiplying by the maximum flight speed under test. This certainly gives the minimum power expended on flight under such conditions, so that the efficiency in the next column is an understatement rather than an overstatement of the actual value. The figure in the next column to that is based on the addition of the power used in flight to the power used in climbing; its expression as a percentage of the engine power is merely a numerical convenience, for inasmuch as the engine is going "all out" on the speed test, there is no reason to suppose that it has any surplus in hand; certainly not sufficient to make the machine climb 200 ft. a minute. Nevertheless, it seems necessary to give credit for climbing as well as speed, in some form of combined figure of merit, because both qualities are desirable in one and the same machine and with one and the same propeller.

The propeller factor is one of vital importance, because although laboratory research tends to show that one "wind-stick" is often much the same as another, practical experience undoubtedly emphasises how slight differences may produce disproportionate results on one particular machine. A propeller that is good for climbing is not necessarily the best for speed; probably, in fact, it is *not* the best. Nevertheless, the engine must use it for both purposes. This was very strikingly shown by a practical experiment conducted some little while ago at Brooklands by Mr. Lang, who designs the propellers for the Bristol Company. He rigged up a chassis to be propelled by the thrust of a propeller driven by an aero engine, and found some quite extraordinary data as to the different rates at which screws of fair similitude would climb Brooklands test hill and develop high velocities on the flat. It was not easy to make any practical deductions as to propellers from the results of these trials, and the only one that occurs to me at the moment is summed up in the figure that represents the percentage value of the horse-power expended on the velocity plus the horse-power expended on the climb.

Great importance being attached to the question of variable speed, it is proper to draw particular attention to the remarkable results achieved by Cody. A range of speed from 48.5 to 72.4 m.p.h. is something that might be of immense value in practical service, and is more than likely to be essential in machines of this weight and size. In this connection, however, I should like to draw especial attention to the fact that the Cody biplane is designed for a low value of X inasmuch as its weight per horse-power and its weight per sq. ft. are both moderate.

More figures for the climb are available than was the case last week, but they are still very incomplete. There is sufficient evidence, however, to show that the modern monoplane carries a reserve of nearly 20 per cent. of its engine power for the purposes of rapid ascent.

In the columns for fuel and oil, a new figure has been added which was not there last week, namely the ratio of the petrol to the oil consumed. In a motor car running 500 miles to a gallon of lubricant, and 20 miles to the gallon of petrol at 30 m.p.h., the ratio of petrol to oil consumed is about 25 to 1. These relative

amounts would have considerable significance if there should happen to be any difficulty in obtaining proper lubricating oil wherever it is possible to obtain a fresh supply of fuel. In a word, it will never do for the fuel and the oil to need simultaneous replenishment unless it is immaterial what brand of oil is used for the purpose. It does not matter appreciably what sort of petrol is used, but it is a significant fact that the very engines that are most extravagant with their lubricating oil need a special kind that is not available everywhere. Moreover, there is no evidence to show that they could be used with safety on anything but the proper material. It would be ridiculous, but it would be by no means an unlikely thing to happen, for a Gnome-engined aeroplane to get stranded for lack of oil, if used on actual service in some out of the way place where petrol only is available. The only engine, apparently, that approaches motor car conditions, and has thus far been tested in these trials, is the 120-h.p. Austro-Daimler, which has a ratio of over 21. In the Renault it is less than 10 to 1 and in the rotary Gnome it is seldom better than 4 to 1.

Attention is drawn to the fact that corrected values for horse-powers have now been used throughout the table; these corrections, although probably not exact, would appear by all accounts to be nearer the mark than the makers' rating. I have been unable to obtain evidence of actual h.p. with regard to many of the engines, and in those cases have worked to the stated value. This has, of course, affected that important factor in design, namely, cubic inches of cylinder capacity per h.p., which is also to be found in the table. In this connection it is impossible to ignore the importance of the high value employed in the Gnome, which has as much as 12 cubic ins. per h.p. in its earlier designs, and has only lately, in the new 80-h.p. model, ventured to reduce this value to 9.6. Mr. Strickland—who, among writers on the subject, was probably the first to emphasise the especial significance of the factor in question in relation to aeroplane engines in particular—has always contended that this high value, in conjunction with excellent workmanship, are the two things mainly responsible for the success of the most successful engine of the day. It is not difficult, of course, to have as high a value as you please to design, but it is not easy to approach the figure that obtains for the Gnome with the same weight of material that suffices it for the purpose.

Several corrections have been rendered necessary in the columns for weight and surface, as compared with last week's table, and quite the most unfortunate aspect of the present data is the absence of definite information as to the weight of the machines. The weighbridge being in the open and the machines being sensitive to the wind, has made it impossible to carry out any wholesale work in this direction, indeed, only the Blériot No. 4 has thus far been officially measured. The figures of the Bristol machine, however, are probably accurate, because this firm makes a regular practice of weighing everything that goes out to fly. On the other hand, there is no doubt that the makers' original estimates for the weights of some of the machines have been wide of the mark indeed, and although I have been at some pains to try and get approximate values, further corrections will probably



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Messrs. Busteed (in the pilot's seat) and Harrison, snapped just before starting away in a 31-15 m.p.h. wind for a flight on the new military Bristol monoplane. The picture on the left shows the machine in flight.

be necessary in many instances when the official figures are known. To some extent, there is a similar difficulty in ascertaining an exact wing surface measurement, inasmuch as peculiarities of plan form and tail design often render a mere linear calculation somewhat wide of the mark. For my own part, I think the authorities might

well obtain a precise statement on the matter from the designer personally, who alone is really in a position to know the circumstances of his own case. For the rough-and-ready purposes of the table in its present form, however, there is no great likelihood that the areas there stated are seriously at fault.

SOME NOTES ON, AND A RECORD BY THE ROYAL AIRCRAFT FACTORY'S BIPLANE "BE 2" AT SALISBURY.

A GROUP of people ran madly across a ploughed field and I beat Coanda, designer of the Bristols, by a short head and a twisted foot at the last hole. The excitement is due to the sight of an approaching aeroplane, Prevost on the French "Dep." being expected to lead off in the landing test of the Military Competition on Salisbury Plain. The sheds are three or four miles away, and the plough is an isolated spot with its little band of enthusiastic spectators, who collect together in a great grass hollow in the centre of the field, which, surrounded by warning flags, constitutes a safe vantage point in the very heart of the danger zone. Someone with binoculars, or perhaps Strickland with his telescope—which is a much more useful instrument for this sort of work, having so well combined the three qualities of magnification, field and light—finds out that it is not the "Dep." that is skimming towards us out of the lower sky, but a non-competitor, to wit, de Havilland, on the Royal Aircraft Factory's tractor biplane BE 2.

On board is Major Sykes—secretary to the meeting, an indefatigable worker, and a friend to journalists and other unfortunate people generally—who has come over to inspect the ground. Like a bird, the machine alights gracefully in an adjacent field, those aboard take a glance in our direction; and like a bird again, the aeroplane hops over the fence and alights with equal ease and safety on the plough, just as if it were running light instead of carrying the regulation 350 lbs. of load in addition to fuel and oil for 4½ hours. Then it taxis round to get into position and rises out of the harrow up wind and once more goes over the fence into the next field so as to be out of the way while Prevost, on the French Dep., who has now approached, slips into the furrow in a cloud of dust and comes gently and safely to rest. A moment's halt and he is off again up wind, with a wire fence less than 150 yards in front of him; it is a close thing, for a ploughed field is slow going on wheels, but with a final sprint the aeroplane springs lightly up into the air and is off through distant space.

And there stands BE 2 quietly on the grass in the next field, inviting a ride. "Will you take me back to the sheds, de Havilland, while Major Sykes is busy talking to Gen. Henderson?" I ask, and "Yes, certainly, but you may find it bumpy," says G. de H., putting on his flying cap and goggles, while I clamber into the front seat, a wicker basket affair that seems uncommonly comfortable. Going to the propeller de Havilland gives it a pull round, as one would start a motor-car engine, and the 70-h.p. Renault gets gently into action. No one holds the machine as the pilot calmly walks round to the back and gets into his seat, for the engine is throttled down to a speed at which the propeller draught exerts but an insignificant thrust compared with that which is presently to come.

Opening the throttle a little we turn round into position, for at first the machine was within a few feet of the fence, and accelerate down wind. Not a bump of any description comes to indicate whether or no we are still in contact with the earth, but it is quite certain a moment later that we are flying as with a quiet but determined stride the machine steps up into the air. And then the ascent continues and the ground that used to be in front of one's eyes lays itself down like a carpet to be looked upon and walked over with fairy-like footsteps from above.

It is already difficult, these days of things that are facts, and children coming to a knowledgeable age who have never known the air without its engine-driven birds, to remember the romance of flying and a little of its mystery. Up aloft there on the magic carpet I tried to think of it so, and something of the mental atmosphere appropriate to the thought clouded the mind for awhile, so that the whirr of the engine and the draught from the screw wove themselves into a dreamland, where I walked upon air, and felt like a god in the realm of space looking at the world and her little men tied to the earth below. And the novelty of the situation—for to dream that one is flying is not uncommon—is to find that the dream is true: true, that is to say, so far as the reality of being up in the air is concerned; but as to the feeling of omnipotence appropriate to the rest of the analogy—well, that depends a little on the temperature of the toes. "Cold feet" would be a poor thing to suffer from on BE 2, with de Havilland at the mushroom-topped control-lever; and my shoes were on the exhaust-pipe, anyway, as I only discovered when the leather had ceased to be useful any more as a non-conductor of heat.

As for the going of the machine, we were running with the wind at anything between 75 and 80 miles an hour and it seemed as steady as a rock. Once there was a little drop such as a small boat might give in a "lop" and once a little heave as we passed through a choppy sea. And now the sheds are just in front, so de Havilland puts round into the wind on a small bank and we glide downwards with a smooth easy motion that appeals to me as the most exhilarating part of a flight and one least associated in my mind with any feeling of nervousness, notwithstanding that the ground approaches with an amazing rapidity. At the last moment, a skilful movement of the elevator flattens out the machine so that it flies parallel to the ground and a second later the wheels touch the grass and we come to rest on terra firma once more.

Of all the events in the trials, none have impressed me more than this simple flying to and fro. Neither the intricate manoeuvring of the Deperdussin by Prevost, the "flat gliding" by Verrier on the Maurice Farman, the rocket-like ascent of Bielovucic on the Hanriot, the wind riding by Bell on the Martin Handasyde, nor the several performances of other excellent machines have quite served to bring home the utility of the aeroplane as did the simple assurance with which de Havilland used BE 2 in the service of those who had occasion to go from place to place.

One of the neatest biplanes ever built, and one moreover that impresses the engineering sense with an immediate satisfaction in the quality of its design, BE 2 demonstrates the value of scientifically practical research at its every flight. It is never flown save with a purpose, and few flights fail to bring some factor of utility to the store of knowledge possessed by the R.A.F.

Its main planes are of practically equal span, the upper being slightly the longer. Their area is 372 sq. ft., the weight of the machine is 1,050 lbs., and it flies at about 1,600 lbs. under the conditions of the Military Trials. The struts, two pairs on each wing, are flexibly mounted and cross-braced with steel wire. The rear bracing consists of the warping wires, which pass over pulleys set on a level with the planes. The body, which also forms a backbone to carry the tail, accommodates pilot and passenger in tandem, the latter being in front and having an excellent view in all directions, for the engine, a 70-h.p. V-type Renault is well forward and does not obstruct the view at all. The engine is carried on tubular steel extensions of the upper boom of the backbone, which also serve excellently as points from which drift wires can be taken to the upper and lower planes and to the chassis.

It is the best stayed machine in this respect that I have seen. Guy wires are also carried from the extremities of the middle front struts to the backbone, joining it at a point about two-thirds of the way to the tail, and from the top of the front struts that stand out of the body to a point on either side of the pilot's seat. Beneath, from these points, wires go to the chassis skids, from which spring wires to the inner sides of the lower planes. Thus there are two lift wires from beneath the centre of each front spar to the ends of the skids, and two fore and aft diagonals to stiffen the backbone against side shocks from above the same point.

It is a most scientifically-stayed machine, for a very complete system of trussing has been effected with few wires, and certainly the apparent head resistance is small.

By these wires, body, undercarriage and wings are formed into a composite unit that ought to have an immense rigidity notwithstanding the slender grace that is such a characteristic of the machine's appearance. Not always is it evident that aeroplane designers pay sufficient regard to the fact that the backbone makes a very powerful lever wherewith to strain itself out of alignment with the planes in times of great stress and shock. Or, the importance of the stay wires enumerated above, may be regarded from the point of view of the necessity for steadying the wings in both directions in their own plane. Drift wires are none too common, and wires that oppose the drift wires are still less often to be seen. The combination of the two is a simple and excellent method of giving lateral rigidity to the backbone and of ensuring the maintenance of the proper alignment of the wings with this member.

The tail has a large semi-circular fixed plane with a slight top camber. This is fastened to the top of the backbone, which from this point has a turtle deck as far as the pilot's seat, in order to give a fair streamline run. The elevating-flaps are together almost as

large as the tail, while the rudder is a little smaller than one of the elevator-members, and seems well proportioned to the size of the machine. A simple pivoted skid, with spring attachment, supports the tail on the ground.

The undercarriage consists of six struts and two skids, arranged on a modified plan of the A-frame principle. The skids project well forwards, but are not much curved. The axle lies across them near the rear, and two struts spring upwards and apart from each heel to carry the body. A third strut rises from near the toe to stay the engine-bearers.

It is difficult to explain in words the precise quality in the design of this machine that calls forth the admiration of the engineer, and it is certainly not in any way due to smart finish of superficial details, for although the workmanship is excellent, the hand of the experimenter is on it still. The fact remains, that for a well-designed tractor biplane, BE 2 of the R.A.F. is hard to beat, and some points in it might well be worth copying by those in search of Army orders.

On Monday, August 12th, at about 5 o'clock in the morning, de Havilland made a splendid altitude ascent on BE 2 which must be very nearly, if not actually, a record. The barograph registered 9,500 feet when he came down three hours later and the starting point to which the zero of the instrument was set is already about 400 feet or more above sea level. Roughly speaking, therefore, BE 2 in ordinary touring trim with pilot and passenger (Major Sykes), all its fuel, oil, instruments and other odd "gadgets" went up to the region of 10,000 feet above sea level. It was flying, in fact, under trial conditions and with no special preparation other than is proper to the keeping of an aeroplane, or any other machine, in going order. Weighed immediately after the descent the machine alone scaled 1,274 lbs., of which 30 lbs. rested on the weighbridge under the tail skid. To this must be added the fuel and oil used on the three hours' trip, the pilot and passenger, who scaled 315 lbs.

together. At starting, the weight in flight was therefore probably in the order of 1,750 lbs.

The first 1,000 ft. was timed by Major Sykes at 2 mins. 55 secs., i.e., at 344 ft. per minute. This represents an expenditure of about 18-h.p. or 25.5 per cent. of its rated power, which is very high, is an indication of general efficiency, and some evidence of a very useful narrow 4-bladed screw. The 7,000 ft. level was reached in 35 mins., but from 6,000 ft., upwards, the rate of climbing was very slow, owing to the rarefied atmosphere at these altitudes. The barometer hereabouts reads only in the neighbourhood of 20 ins. of mercury, so that there is a very great decrease in the mass of air deflected by the planes at a given speed. In the end, the lift diminishes so much that there is no surplus for further ascent and the machine stops climbing. This happened at 9,500 ft. with BE 2, because de Havilland tried for half-an-hour to get higher, but was unable to do so.

In climbing at great altitudes, pilots always keep a steady angle of inclination and de Havilland sets BE 2 until her flight speed is down to 47 m.p.h. If there is no change in the barograph after a reasonable time under these conditions, the ascent is finished, it is impossible to go higher and it is generally time to come down. The descent is at first more rapid than normal in the region of reduced pressure. No trouble with the carburettor was experienced from start to finish and no adjustment was made; nor did either pilot or passenger experience inconvenience save from the cold.

Two strata of clouds were passed through, and the land was shut out from sight; their whereabouts on descending was quite unknown to either de Havilland or Major Sykes. Sighting a railway station, they flew close to it, and were able to read the name Hermitage, and following the line south to Newbury, they branched off to Andover and followed the main road to Amesbury, where they descended in front of the sheds after a most interesting trip.

A DAY BY DAY DIARY.

By a Special Correspondent.

Lark Hill Camp.

A HIGH wind prevailed all day Tuesday, August 6th, but the Chenu-engined Martin Handasyde, handled by Gordon Bell, took advantage of a momentary lull, when the gusts seldom exceeded 34 m.p.h. and never dropped below 16 m.p.h., to take the air for its wind test. In spite of the fact that a wind of this velocity is a fairly stiff breeze, the machine appeared to be totally unaffected by it, except when a gust striking her lengthways made her rise perpendicularly for forty feet or so.

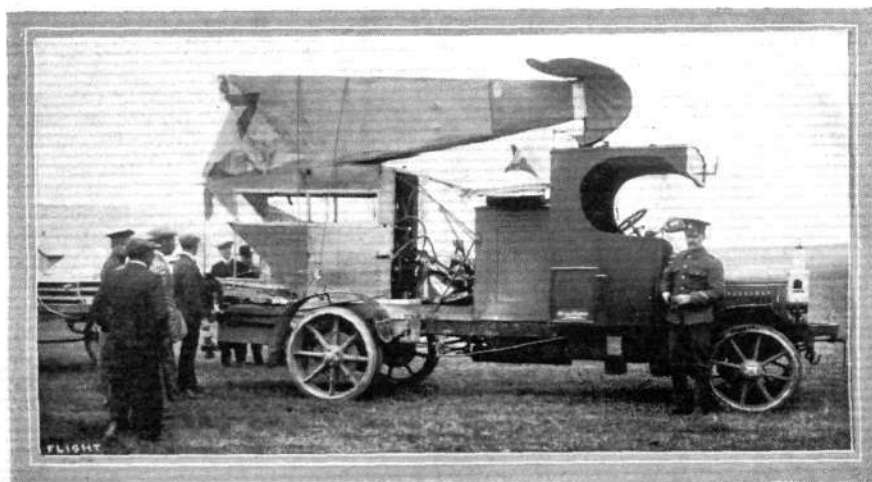
On Wednesday the weather conditions remained much the same. At 4.30 p.m. Bell again took out the Martin Handasyde, and effected an entirely successful flight. He was followed an hour later by Busted on the Coanda-type Bristol monoplane with a passenger. This machine also appeared unaffected by the wind, which still remained very high. Cody tested his Austro-Daimler engine, but said he thought he would not go up just then: example overruled precaution a few minutes later, however. Prevost took up Capt. Dawes in the 100-h.p. Gnome Deperdussin, and appeared to have a fairly busy time. McDonald on the Vickers was forced

to alight on the other side of the valley owing to a defective pressure feed. Verrier flew the Maurice Farman for some time, passing the climbing test at his second attempt, and finishing up with a lovely "pancake" glide from some height. The machine appeared to stand still at times when against the wind. These pilots, by the way, had all entered for the trial—"To fly satisfactorily in a wind 25 m.p.h. at 25 ft. from the ground."

Lieut. Parke was out testing the Green-engined Avro after the fitting of a new propeller. It should be noted that five out of the seven who found flying in a wind agreeable were British pilots on British machines, a fact of which we hope that the military and naval authorities will take note. Perreyon attempted the climbing test on the tandem Blériot, but again failed to rise 200 ft. a minute. Parke, who had steadily been flying for over three-quarters of an hour round the surrounding country, landed some way down the hill on the side of the valley, between the sheds and Fargo Wood. After traversing the ground for some little distance the machine was seen to stand on its nose, and then turn completely over. A few seconds later Parke appeared, and was seen to run round the wreckage. Cars

drove across in great numbers, and the cause of the accident was explained by Parke, who was one of the first to set to work dismantling. He was pulled down so much by *remous* that he did not think he would be able to circle over the sheds and land against the wind; so he landed at some considerable distance from them, naturally travelling at a very high speed. On touching earth he ran into a very bad piece of ground, full of hillocks and long grass. The opposition to the undercarriage made by this caused it to be dragged back, breaking one wire and the axle. The broken axle, consequently, was twisted round and stuck in the ground like a sprag, so that the machine turned a somersault, and was badly smashed. The engine, however, was undamaged. Great sympathy will be felt by all for Mr. Roe and Lieut. Parke, the accident being a piece of sheer bad luck. Attempts are being made to rebuild it at Manchester to continue in the competition.

On Thursday morning at 4.30 a.m. the first competition machine out was the Coventry Ordnance with the 100-h.p. Gnome, piloted by Sopwith and having Copland Perry as passenger. Busted took Capt. Dawes for a "joy ride," on his attempt for the three hours' test, on the Coanda-type Bristol fitted with a 80-h.p. Gnome. He came down after a short while, however, deciding to wait for better



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Taking home the wreckage of the Avro biplane to Manchester, where Messrs. A. V. Roe and Co. tackled the "problem," and had it on its way back to Larkhill by Wednesday evening. The Avro firm need not be included in the "Wake up England" admonition!

weather conditions. Lieut. Porte followed on the British Deperdussin.

There was a vast crowd to watch the exhibition flying before Members of Parliament, who came down early in the afternoon. They were shown the machines in parties by various officers, and very amusing were some of the questions asked.

A strong wind was blowing, but in spite of this, proceedings were started by Verrier on the Aircraft Co.'s Maurice Farman at about 4 o'clock, who took Capt. Dawes as passenger. The crowd round them was considerable, cameras and cinematographs being largely in evidence. On their coming down after the usual pancake glide, Capt. Dawes made a few remarks upon Verrier taking his hands off the control to demonstrate stability when he was passenger. The Chenu-engined Martin Handasyde was the next to ascend and was nearly, but not quite, the victim of a nasty smash through engine trouble. Bell was making the machine climb at a considerable angle after the first "get off" when his engine was heard to suddenly cease work. Managing to get the nose down in a very smart fashion he dived, the machine not being sufficiently far from the ground to get on to its proper gliding-angle. Luckily the ground landed on was down hill, and although he appeared from the spectators position to strike the ground with great force, he in no way damaged the machine, thanks to the excellent landing chassis and his own skill. The cause of the "atterissage" was due to a broken magneto drive, this having occurred six times in the past fortnight. The next up was Prevost, on the 100-h.p. Deperdussin, making a very impressive flight. Circling the ground, he shut off his engine and dived, then, when nearing the earth, he switched on again, and once more circled the ground, making fine banked turns. It should be remembered that a strong wind was prevailing, being between 30 and 35 m.p.h.—scarcely the atmosphere in which to do "stunt" flying. This pilot was received with great enthusiasm. Busted on the Coanda-Bristol and Sippe on the Hanriot were out subsequently.

Perreyon then again attempted his climbing test, and passed it successfully, climbing 1,000 ft. in 4 mins. McDonald made several circuits on the Vickers, appearing to be most at home at a height. The machine glides very well indeed. Apart from competition flying, other good displays were made by Lieut. Conner on the Nieuport, Capt. Hamilton on the Deperdussin and Lieut. Fox on the Aircraft biplane, having a Maxim mounted at the bow, which, however, was not discharged. Towards the end of the evening Major Brooke-Popham flew over from Wanstead, where he had previously been forced to alight, followed by de Havilland on BE 2 machine from Farnborough. The Bristol monoplane, piloted by Valentine was undergoing an engine test, repairs after his smash having been carried out in four days.

Thursday's flying must certainly have been very educational to our legislators and to the notabilities who arrived. It must have opened their eyes to the fact that aviation has greatly advanced since even a year ago, and made them realise that the aeroplane has now gone far beyond the experimental stage.

On Friday morning, Sippe, on the Hanriot, and Perreyon, on the Blériot, attempted the speed test. The minimum, it should be noted, is 55 m.p.h. The former attained a speed of nearly 75 m.p.h. He did not attempt the slow-flying contest, thinking it better to wait for a calm. Perreyon reached 61 m.p.h. Cody was out doing circuits, and the Breguet made its first appearance, coming to grief, however, through a broken undercarriage. Piloted by Fenwick, the Mersey put up a very good show, climbing well, with Swaby as passenger and a load of petrol sufficient for six hours. Gordon Bell flew the Antoinette-engined Martin Handasyde from Brooklands, being forced to alight at Bulford Camp, through a broken water-connection, which sprayed him with boiling water. Repairs were made and he continued to Lark Hill. The 100-h.p. Deperdussin was flown by Prevost in the ploughed field test, which it passed successfully. This machine is ahead of all, having already passed the assembling, the climbing, the three hours, and the wind test. Busted was out, and three military aircraft machines flew over from Farnborough. An interesting arrival was the Gamma dirigible, and the provision for its being able to be moored in a wind so that its head is always in that direction. This consists of a tall pole fitted with a revolving cone, into which the nose of the machine is placed. This, however, was not erected until the machine was ready to start at 12.30.

The afternoon was the best time for flying that we have had since last Thursday, sixty-seven flights being made before dusk. The 100-h.p. Gnome-Deperdussin under the pilotage of Prevost set off to the scene of the fast and slow speed tests with Major Sykes as passenger. Two Aircraft machines, Capt. Hamilton on his Deperdussin and Pizey on the Bristol monoplane, were out. We are not attempting to report here all the flying that is done by machines apart from those entered for the Army Trials, but we may mention that the machine flown by Pizey was being tested before Italian

Government representatives, and it could hardly fail to give complete satisfaction with its 3,200 ft. climb in 16 mins. Cody and the Maurice Farman then joined Prevost at the speed test, which was held on Knighton Down. The 100-h.p. Gnome Coventry Ordnance had a new pilot in the person of Raynham, who flew the machine very well, first by himself and later with Howard Wright as passenger. Valentine flew the Coanda-Bristol for the first time since the smash, everything appearing in order. Prevost then returned from his speed and climbing tests, making minute circles with 45° banks over the sheds. He then ascended to 1,000 ft. and came down in a fine S-curve *vol plané*. People waited till dusk for the return of Cody and the Maurice Farman, but not until long after dark did they come back, the former wandering over the Plain before so doing. It was found that he had easily passed his speed test, but not by as great a margin as he would have liked, only attaining 69 m.p.h. His engine was not firing in one cylinder and he did not reach the 75 m.p.h. which he expects. On applying to the officials and showing them the reason for the "slow" speed he had made, he was given permission to go for the test again. In the slow speed test he diminished his velocity he tells us to 47 m.p.h.—truly a marvellous performance for a 75 m.p.h. machine. We believe that this is accomplished by reason of his wing construction—the plane automatically flattening itself out under increased velocity of travel.

The Maurice Farman, piloted by Verrier, flew the fast test at 55.2 m.p.h. and the slow test at 37 m.p.h. It also passed the gliding test. This machine, up to the present (Saturday), has passed the assembling, the climbing, the three hours, the fast-and-slow speed, and the gliding test.

On Saturday morning, Cody was out for an unofficial speed test with all his cylinders working and reached a velocity of 72 m.p.h. He still is not satisfied and hopes to do better later. He was out from 5.50 to 7.12 a.m. The Breguet with Canton-Unné engine was in the air, but owing to engine trouble would not get off the ground at a satisfactory angle. The Army Breguet was flying very well indeed. Bielovucic on the Hanriot and Busted on the Bristol both attempted the three-hour test, but neither relishing the prospect of staying up in the wind that had risen, they both descended. Sippe started off on the Hanriot for his speed test with Capt. Dawes as passenger, but finding there was no observer at the fort, returned and took Bielovucic for a "joy ride."

Later in the morning, which was windy and wet, the French Deperdussin started for the road transport test, having passed all the other necessary trials. For this, the machine has to be "taken down" and trundled along the road behind a car; it is then erected again and flown. Prevost finished up by flying in the afternoon in a 30-m.p.h. wind.

In the evening, the wind was still high, but Capt. Hamilton started operations on the Anzani-Deperdussin, his smoky exhaust showing up strongly against some thunder clouds. Bielovucic made a trial on the 100-h.p. Hanriot, finishing up with a fine spiral glide, which he made somewhat steep for this machine in order that he might not be disturbed by the gusty wind prevailing. The Army Breguet and the 10-cyl. British Deperdussin both followed, flying well in the bad conditions.

The Mersey has been hung up by the want of some new rubber springs for the undercarriage, having somewhat damaged them on the last occasion it was out. The Chenu-engined Martin Handasyde is *hors de combat* through the magneto drive, which has once more given trouble. The Handley Page is, at the moment of writing, not quite completed. The Flanders is still delayed by non-delivery of its engine, the minor accident which occurred in transport having been quickly repaired. The Chenu-Coventry Ordnance is, like the Martin Handasyde, still subject to engine trouble. The Canton-Unné Breguet is also experiencing the same trouble, and though one short flight has been made, nothing satisfactory was accomplished.

Saturday evening the French Dep. was taken to pieces so that its wings could be packed up against the sides of the body for road transport, and having been duly trundled down the highway as far as Stonehenge Inn and back again, was reassembled and flown for a last official flight by Prevost. The trial was then over so far as No. 26 was concerned, and all is credit to pilot, and machine and firm for getting through in such excellent time and such splendid style. Bielovucic, with Lieut. Laurence on Hanriot No. 1, went out in the wind which the pilot subsequently reported to be very steady. Meanwhile Breguet again tested its engine and struggled hard to get the extra 300 over and above the 1,000 r.p.m. already available.

Sunday, no official flying of any sort could take place to-day, but in the evening Pixton, newly transferred to the Bristol monoplane No. 15, went aloft for exercise, and Busted also took practice, to get his hand in for the climb, which is just about as much as his machine can accomplish with its naturally high speed and load.

Also out this evening, the Mersey, in the hands of its designer, R. C. Fenwick, appeared to have no difficulty about flying. It is a new and interesting stern-driven monoplane, and has a 45-h.p. Isaacson engine that runs very nicely. Verrier went up into the higher regions on the Aircraft Co.'s Maurice Farman, and the Breguet again had attention paid to its engine.

Monday morning turned out to be one of the best of flying days and Cody was up and about at a quarter to four, his machine ready tuned for the speed trial, but no one to observe it. Officers from the camp at Larkhill arrived with dispatch, however, and by half-past seven Cody was through the event with much credit and glory. Also bestirring betimes was Busted on his Bristol monoplane, firmly determined to qualify in the three-hours test before breakfast. Rising at 5.13 he flew swiftly through space; anon going out of sight down a cloud alley, whence, as he said afterwards, he had much difficulty in finding a way out. Next on the list for trial in the Deperdussin camp was Lieut. Porte's machine, which has the 100-h.p. Anzani engine. He, too, was after qualifying, but a faulty ignition plug brought him back again over quick to his shed. Sippe on Hanriot 2 flew off to Knighton Down about a quarter to six, and returned before half-past seven with a maximum of nearly 75½ m.p.h. to his credit and a slow speed of 66.6. Verrier on the Maurice Farman went to the ploughed field four miles away, alighted with ease and returned to camp. The Vickers was on the grass betimes, but for the most part stayed there with a faulty engine. Sopwith took Howard Wright for a run in the Coventry Ordnance, and afterwards made a short solo.

After breakfast the weather changed for the worse, and in the afternoon there was little improvement. Bell, having brought over the other Martin Handasyde from Brooklands, was again busy making his engine run properly, but having changed the plugs, was at last able to transfer his attention to the air.

Bielovucic ascended for his wind test about tea time and made a fine flight on the Hanriot. A circuit by Pixton on the Bristol monoplane, later in the evening, completed the day's performances.

Tuesday. The Blériot monoplane No. 4 having finished its test, including road transport, was reassembled after breakfast, the weather being so bad in the early morning that no one opened his shed. It took 27 minutes to reassemble the Blériot and start the engine, which delayed things a little at first. The Blériot was the second machine to finish the trials. Again the Breguet was struggling to get its proper engine power, and in the same quarter of the grounds the diminutive Piggott biplane made its first appearance and started its engine for a preliminary test. Heavy rain fell after luncheon, but the weather quietened in the evening sufficiently to encourage some of the pilots to go aloft. Among them, Fenwick took out his Mersey and flew towards Stonehenge. Passing over a hollow, the machine was caught in a *remous*, and, although all were too far off to see exactly what happened, a death struggle apparently took place between man and wind. The man lost and fell, and when those had returned who rushed to the scene of disaster, it was known that another British pilot must have his name inscribed on the everlasting roll of the honoured dead.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, 13th inst., 1912, when there were present:—Sir Charles D. Rose, Bart., M.P., in the Chair, Mr. Griffith Brewer, Mr. G. B. Cockburn, Capt. Bertram Dickson, R.F.A., Mr. F. K. McClean, Mr. Alec Ogilvie, Mr. C. F. Pollock, and Mr. A. Mortimer Singer.

New Members.—The following new members were elected:—Robert Smith Barry, Herbert Muir Beddall, Lieut. Alan Hartree, R.F.A., E. L. Herman, M.V.O., Henry Hillcoat, G. R. G. Huddleston, Major Frederick George Jackson, and Arthur Turner. Total membership to date, 1,405.

Aviators' Certificates.—The following aviators' certificates were granted:—

268. Ralph Gerald Holyoake (Bristol Biplane, Bristol School, Brooklands).
269. Air Mechanic William Thomas James McCudden (Bristol Biplane, Army School, Salisbury Plain).
270. Major Hugh Montague Trenchard (Farman Biplane, Sopwith School, Brooklands).
271. Lieut. Reginald Cholmondeley (Grahame-White Biplane, Grahame-White School, Hendon).
272. Capt. John Maitland Salmond (Grahame-White Biplane, Grahame-White School, Hendon).
273. Capt. Alister Maxwell MacDonell (Bristol Biplane, Bristol School, Brooklands).
274. William Snowdon Hedley (Farman Biplane, Sopwith School, Brooklands).
275. William John Harrison (Deperdussin Monoplane, Deperdussin School, Hendon). (Subject to permission of the Aero Club de France.)

Flights over the Thames.

The Committee of the Royal Aero Club has had under its consideration the question of the desirability of flights over the Thames through London, and has decided, pending a conference with the authorities, to forbid such flights.

Dublin to Belfast Race.

The race from Dublin to Belfast and back will take place on Saturday, September 7th next, and the winner will be the competitor who, on an aeroplane in flight, accomplishes the distance in the shortest time. The arrangements are in the hands of the Aero Club of Ireland. The entries close on the 19th inst., and regulations and entry forms can be obtained from the Secretary of the Royal Aero Club. The following prizes are offered:—First Prize, £300; Second Prize, £75.

Flights over Army Manœuvres, Eastern Counties.

A large number of replies have been received from aviators in response to the letter from the Chairman of July 29th, 1912, asking them to refrain from making flights over the manœuvre area between September 7th and 20th next. The Chairman will be glad to receive replies from any aviators who have not yet acceded to his request.

Presentation of Pictures.

Mr. Hugh Spottiswoode has very kindly presented to the club the three original drawings dealing with Mr. F. K. McClean's flight at Eastbourne, and a framed copy of the photographs taken of the wreck of the R. M. S. "Oceana."

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

A Military School in Australia.

It is hoped that a practical start will be made with an Australian military aviation school some time next month. A ground has been arranged for at Duntroon on Federal Capital territory, and two biplanes and two monoplanes will shortly arrive, while two pilots have been engaged. The school is to be run on the same lines as the Central Flying School on Salisbury Plain, and as officers, who will be drawn from the militia establishment, qualify it is proposed to found branches near the various State capitals and at other important points. No doubt the fatal accident to Mr. Lindsay Campbell will be a considerable loss to the Government's projects.

A Mishap in Australia.

On July 6th, the American, A. B. Stone, gave a fine exhibition on his monoplane at Brisbane, but unfortunately it ended in the

machine being smashed. The ground from which the flight was made was really too small, and in making a steep *vol plané* into it at the conclusion the pilot misjudged his distance, and landed heavily, resulting in the machine being overturned. The pilot crawled out from the wreck practically unhurt.

New Deperdussin Superior Pilots.

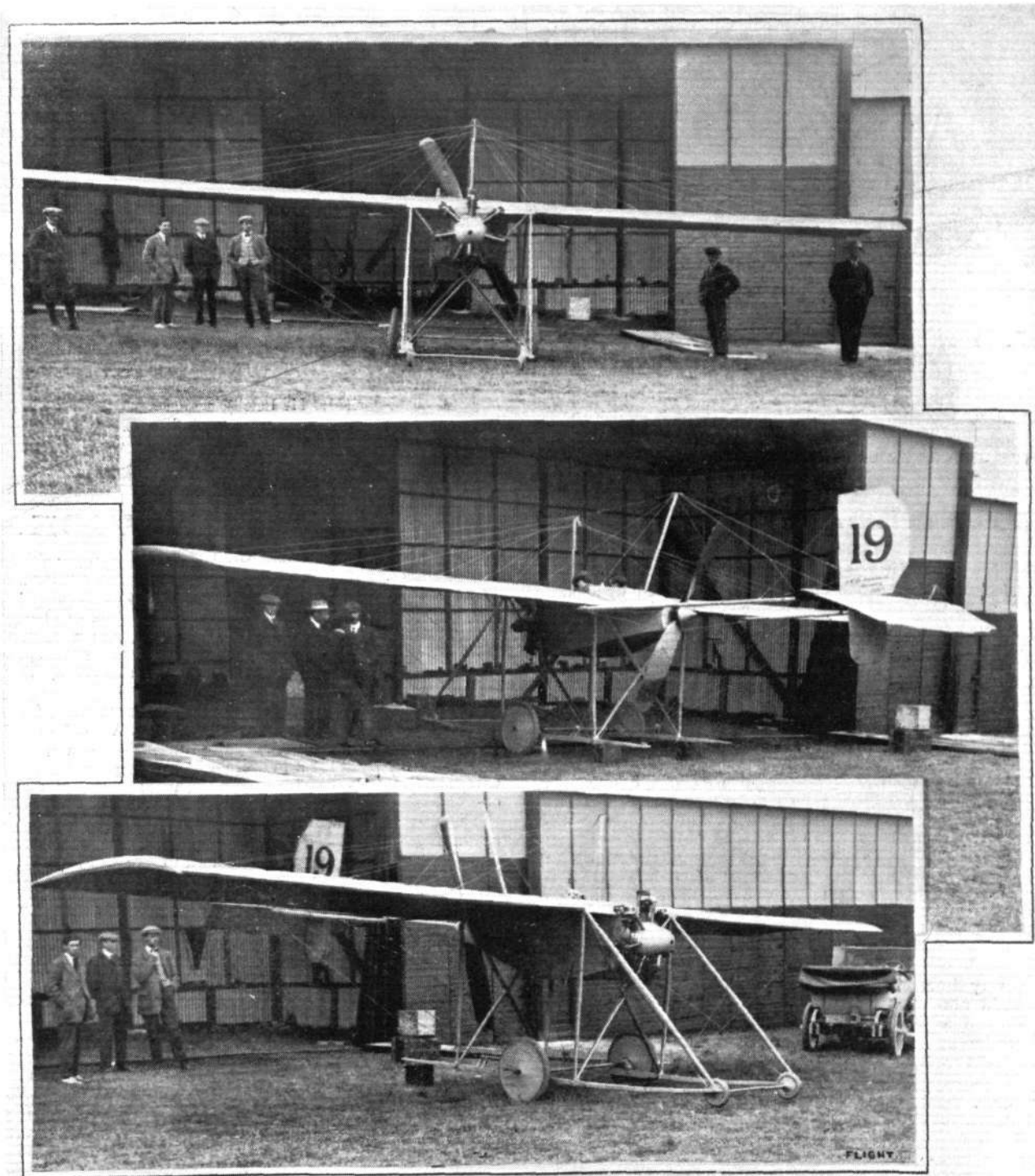
ON the 9th inst. Lieut. Radisson making a third test for a superior *brevet* went from Rheims to Amiens on a Deperdussin in a couple of hours. While at Amiens he inquired as to the possibilities of making a military aerodrome there. Later in the afternoon he flew back to Rheims. He carried out a similar trip on Saturday, when Capt. Estirac and Faure, Lieuts. Degorge, Bresson, Didier and Arreteau and *sous-officiers* Chauroux and Verdier also completed their tests.

THE MERSEY MONOPLANE.

THIS extremely interesting monoplane, which, unhappily, was wrecked at Salisbury Plain on Tuesday evening last and which was contributory to the sad death of its designer and constructor, Mr. R. C. Fenwick, was purely an experimental machine, and had passed through a variety of modifications. The keystone of the design was that the propeller had been arranged behind the pilot and passenger while the engine had been retained in front. In this manner it rendered the machine particularly applicable to military use, for the absence of the propeller in front made observation much more easy and rendered possible the use of a gun pointing forwards. In our opinion it embodied the germ of an idea that was well worthy the time spent to evolve it, but in some ways we considered the constructive details to be a little of the makeshift order, especially as regards the tail trussing. This was a point that we had discussed with Mr. Fenwick a few days previously. He told us that he had

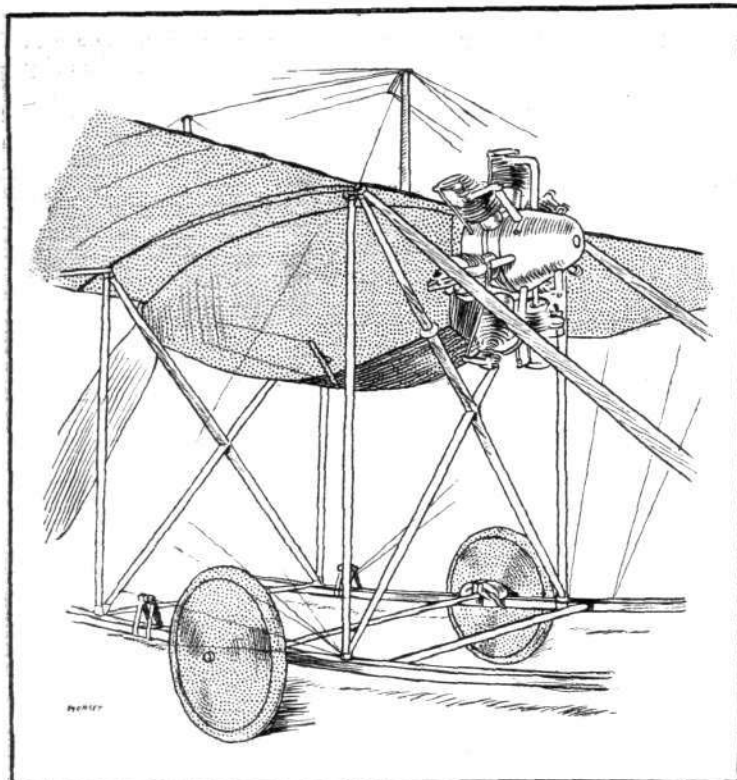
tested the strength of that section of the machine, by hanging a man to the extreme end of the tail and lifting him clear of the ground by the manipulation of the elevator in the slip stream from the propeller. It had withstood that test perfectly, but he was not entirely satisfied and meant to modify it in his next machine. This, however, by the way, for the direct cause of the accident has not yet been definitely established.

The central section of the design was a bluff streamline body 7 ft. in length, in which the pilot and passenger sat side by side. Between them ran the propeller-shaft that connected the motor, a 45-h.p. Isaacson, bolted to the front of the body, to the propeller at the rear. The propeller revolved at half engine speed. The chord dimension of the wings was also 7 ft., and they proceeded outwards from each side of the body without any dihedral angle, spanning 35 feet. Steel spars were used in their construction, and they were



"Flight" Copyright.

The Mersey monoplane, fitted with a 45-h.p. Isaacson engine, at the Army Competitions.

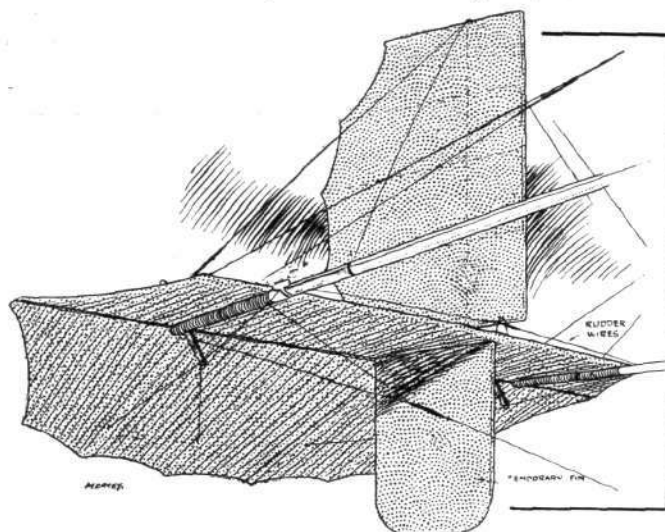


"Flight" Copyright.

THE MERSEY MONOPLANE.—Sketch of the front central section of the machine.

braced in the usual manner to the *cabane* above and the skids below. The body lay wholly below the wings—although the pilot looked out over the top of them—in order to bring the centre of thrust of the propeller on the line of the centre of resistance. The under-

carriage, as will be seen from the sketch, was of the wheel and skid type, and the skids continued far in front of the machine to obviate any chance of the machine, when landing on bad ground, turning on to its nose. The landing gear was exceptionally high. This undoubtedly lowered considerably the centre of resistance and was expected to do so by the designer. The tail, with its elevator and rudder, were carried by an outrigger consisting of two tubular steel booms stayed by single piano wires top and bottom to the overhead mast and the undercarriage. On the previous Sunday evening it had flown very satisfactorily, and under none too pleasant conditions. It has carried, in addition to its pilot (Mr. Fenwick)



"Flight" Copyright.

THE MERSEY MONOPLANE.—The tail of the Mersey monoplane.

and its passenger (Mr. H. Petre), a load of fuel sufficient to keep it in the air for six hours. It rose and flew exceptionally well with all that weight, considering it was equipped with such a relatively low-powered motor as the 45-h.p. Isaacson.

FATAL ACCIDENT TO MR. R. C. FENWICK.

IT is a matter of supreme regret when any aviator should lose his life in the cause, but it is especially to be deplored that the military aeroplane trials should thus have been marred by a fatal accident. Mr. R. C. Fenwick, designer, constructor and pilot of the Mersey monoplane, took his machine out for the third time on Tuesday evening, about a quarter past six, and flew off in the direction of Stonehenge. About a mile and a half from the sheds the machine was noticed to fly unsteadily, and the end of this unhappy effort was, by all accounts, a nose dive to earth at the termination of which Mr. Fenwick was killed and the aeroplane wrecked.

Few people, apparently, saw, or were in a position to see exactly, what happened, but from observations it was noted that the anemometer registered a sudden increase in gustiness about the time the machine started off on its last journey, while Busted, who was flying the Bristol monoplane in that vicinity just previously, is similarly reported to have stated that the *remous* thereabouts were very bad. The why and wherefore of the accident, however, it is the proper purpose of the Public Safety and Accidents Investigation

Committee of the Royal Aero Club to investigate, the *débris* having been thoroughly inspected by responsible persons before it was destroyed by fire. It is, however, to be hoped in this connection that in all cases of disasters of this character, discretion will be used as to the time when the wreckage may be turned into a bonfire, seeing that when a pilot loses his life the least that those living can do in his honour is to profit in all reverence by the lessons of his misfortune.

In all the principal aviation centres, representatives of the safety committee have been appointed by the Royal Aero Club and it is to be hoped that the military authorities, police and aerodrome managers will assist them in efficiently carrying out their work, and will at any rate, as we have suggested, avoid any wanton destruction of invaluable evidence for the sake of hypocritical sentiment.

The aviation world suffers a great loss by Mr. Fenwick's death; he was a clever designer and an able pilot, which combination is none so common that we can afford to lose even one of any we have. The Mersey aeroplane on which the fatal accident occurred was No. 19 in the trials and had made only two previous ascents.

HENDON FLYING.

THERE was very little wind last Saturday, but in order that the aviators should not have it all their own way, the Clerk of the Weather ordered a plentiful supply of rain. But this did not prevent some decent exhibition flying and a Speed Handicap taking place. Lewis Turner, on the Grahame-White Biplane was the first up, flying for about ten minutes. After, Nardini, on his Deperdussin monoplane and Desoutter on the Blériot gave several exhibition flights, the last named flying in his usual daring manner. A Speed Handicap over four laps of the aerodrome was then held, Turner, Nardini and Desoutter being the starters. The latter was scratch man, giving Nardini 5 secs., and Turner 2 mins. 30 secs. start. By the time Nardini had got away, Turner had nearly completed his first lap, but the monoplane soon overhauled the biplane; Desoutter was unable to gain the lead. The result was, therefore, a win for Nardini by 6 $\frac{3}{4}$ th secs., his time for the four laps

being 8 mins. 36 $\frac{3}{4}$ ths secs. Turner was second in 8 mins. 43 secs., and Desoutter's time was 9 mins. 5 $\frac{3}{4}$ ths secs.

As is generally the case with the week-ends at Hendon, Sunday provided a far better show of flying than the previous day, the weather conditions being very much better. The event of the day, was the return of Robert Slack from his I.C.S. tour of the Midlands. He had left Rugby at 5.10 p.m. and arrived at Hendon at 6.10 p.m., thus covering the seventy miles in exactly one hour. Lieut. Parke flew over from Brooklands on an Avro biplane, taking about thirty minutes and landing just after Slack had arrived. During the afternoon exhibition flights were given by the following pilots:—H. J. D. Astley and Marcel Desoutter on the Blériot, Jules Nardini on the Deperdussin, A. Marty on the Ewen School Caudron, R. T. Gates, Lewis Turner, and A. Blackburn on Grahame-White biplanes.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Ground.

LAST week again started badly for flying, the weather conditions being far from pleasant. It, however, wound up with better conditions, and the magnificent flight by Mr. McClean on his Short hydro-aeroplane to Westminster Bridge is referred to elsewhere.

On Thursday morning Lieut. Spencer Grey arrived back on the 70-h.p. Short tractor from Dymchurch; shortly after 9 a.m. the wind got up and put a stop to flying for the rest of the day.

On Wednesday the new Admiralty Breguet was being assembled ready for the test flight by M. Moineau, who is at present at Salisbury, flying in the Army trials, so it may be several days before it is seen in flight. M. Noel attempted once or twice to start for Hendon on the 80-h.p. Farman on which he and Mr. Gates crossed the Channel; the conditions were, however, unfavourable, and a start was not made until 10.30 a.m. on the Monday following.

Thursday saw the usual Admiralty machines and pilots out flying in the evening, including Lieut. Malone 100-h.p. triple tractor with Lieut. Briggs as passenger, Lieut. Spencer Grey on 70-h.p. Short tractor. The 90-h.p. Chenu motor of the Breguet was tested and found to be quite satisfactory; it is to say the least of it pleasant to hear of a motor on an aeroplane that will run down to 200 revolutions per minute when throttled down, and not always to be running either full out or not at all. The steel tubular struts of the Breguet are stream-lined with wooden strips clipped on the rear of same, and if Mr. Ogilvie's strut tests are of any value, it is certain the stream-lines of the struts of this machine are useless.

On Saturday Mr. Jezzi took out his tractor biplane and gave several passenger flights, also again on Sunday evening, and on one occasion the wind was blowing 30-35 m.p.h., but the little machine seemed quite equal to the occasion.

Brooklands Aerodrome.

BRISTOL School as busy as usual, and every morning and evening, except on Monday and Tuesday, when weather prevented, both Mr. Hotchkiss and Mr. Merriam were out carrying pupils. There are now 20 pupils at the school for tuition, and every day as many as 16 to 18 are to be seen on the ground. Every evening and morning, unless weather prevents, each pupil gets either two solo flights or two passenger flights, according to their advancement, and the rate of progress of each pupil is remarkable. This week Mr. Barnwell, Major Ashmore, Lieuts. Playfair, Wanklyn, Gould, Joubert and Capt. Miller have all branched into flying alone and all in less than three days have been successful in flying right and left-hand turns, and are capable of taking their *brevets* at any time, though most of them want to get more practice before doing so. Capt. Brabazon, Messrs. Summerfield and Darracq are all flying solus with much ability. Capt. Brabazon on Friday night had the distinction of finding the sewerage farm through a petrol pipe breaking and motor stopping made it compulsory for him to land. Fortunately he made a perfect landing with no bad results to himself, but through the sinking of the wheels one strut on the machine broke. For three days this week the Bristol School put up about 180 flights with their 8 machines, and queer to say for an aviation school Mr. Hotchkiss and Mr. Merriam keep all their pupils contented and satisfied with the amount of flying they get.

The Avro school machine, with Lieut. Parke up, was out Saturday and Sunday, and on the latter evening, after circling round the aerodrome, disappeared in the direction of Hendon, and we hear arrived safely there in half an hour. This is rather praiseworthy for an old warrior like the Avro machine, as it has done about as much, if not more, work than any machine in the country.

The Vickers School have been usually busy. Capt. Stott making good progress, flying now straights in quite good style. Capt. Beatty, on Saturday and Sunday, was flying Vickers No. 5 in real good form, getting up well over 1,000 ft., and flying round the country out of sight of Brooklands. Mr. Knight was also out several times on the same machine, putting up a very good show.

The Sopwith School have been doing good work, and Mr. Hedley took his *brevet* on the Farman biplane. He averaged very good time, taking 18 and 19 mins. for each five figures of eight, and his landings were of the very best, which shows that his tuition has been beyond reproach. Another pupil, who has only been there four days, was seen out solus flying, doing remarkably well.

On Saturday evening a lot of flying was put up for spectacular purposes, for the benefit of many spectators who visited Brooklands. The Bristols were out in force in the hands of pupils and Mr. Hotchkiss and Mr. Merriam. The two Vickers machines in the hands of Capt. Beatty and Mr.

Knight. The Avro machine with Lieut. Parke up. The 70-h.p. Blériot of Mr. Sopwith's in the hands of Mr. Astley, who flew round at 1,000 ft. up for some considerable time.

On Sunday evening the first machine out was Lieut. Parke on the Avro who entertained the spectators while they had tea. Then came Mr. Merriam on the Bristol monoplane who put up a good flight. After this a bomb-dropping competition and landing nearest the mark competition came on which brought out two Bristol biplanes with Mr. Hotchkiss and Mr. Merriam up, Mr. Raynham on a Farman and Mr. Perry on the Sopwith Farman. Mr. Raynham went first, followed by Mr. Merriam, then Mr. Hotchkiss, and last Mr. Perry. Mr. Hotchkiss for the third time won this competition with 13 ft. 6 ins. from the target. Mr. Merriam on another Bristol won the landing competition with 30 ft. from mark. There was a considerable amount of wind blowing which greatly handicapped the machines in the landing competition and made the distances rather poor. After the competitions Mr. Raynham brought out a new Flanders monoplane, a Government order, and after testing the engine put up an exhibition of flying, which gave one the impression that Mr. Raynham had been flying the machine for some time instead of testing its flying capabilities. The machine rose from the ground in fine style, and did not give the pilot a moment's trouble, which is an obvious recommendation for the way the Flanders machines are turned out.

Capt. Beatty in the evening, on No. 5 Vickers, was over the surrounding country, followed by Knight on the same machine with a small cross-country flight on his own over Chertsey, Addlestone, and West Byfleet about 500 ft. up, finishing with a *vol plané*. Both Knight and Capt. Beatty were at it again afterwards, the latter with right and left-hand turns.

Later in the evening Mr. Hotchkiss held a free raffle for a passenger flight on a Bristol biplane, which has become so popular amongst the spectators at Brooklands, and the lucky number 33 fell to Miss Dene, who greatly appreciated a couple of circuits of Brooklands at a height of about 300 ft.

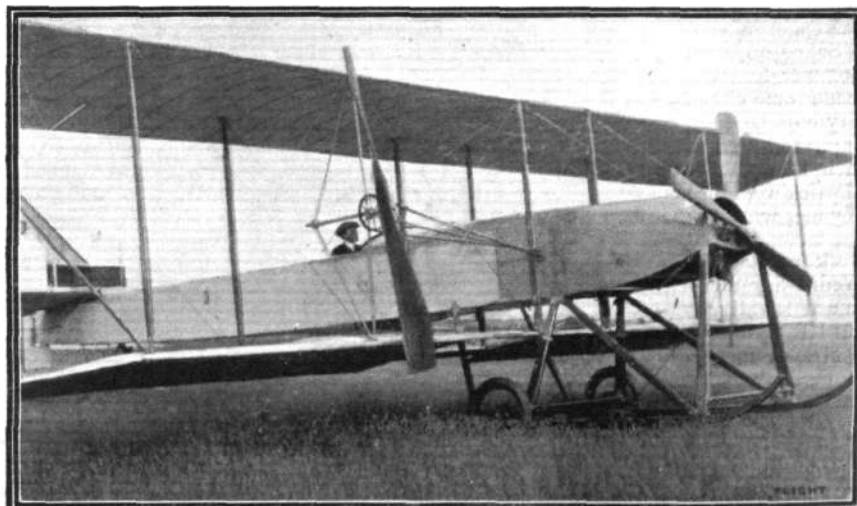
Farnborough (R.F.C.)

TUESDAY evening last week Mr. De Havilland made a circuit on BE 3 but wind too strong for further flying.

Wednesday, towards evening weather cleared up after raining all day. Capt. Mackworth on BE 4, Capt. Rayleigh on Breguet B 3, Major Moss on Henry Farman all flying well in gusty wind. Airship "Gamma" several flights over surrounding villages.

Early Thursday Major Moss 15 mins. flight on Henry Farman. Airship "Gamma" out scouting practice. In evening Major Moss 20 mins. flight on Henry Farman, Major Burke on BE 1, Capt. Mackworth on BE 4, Capt. Rayleigh on Breguet B 3 all flying well and out till dark. Mr. De Havilland flew to Salisbury on BE 3 in very gusty wind. Friday, Major Moss on H. Farman, Major Burke on BE 1, with Lieut. James as passenger, Capt. Mackworth on BE 4, Capt. Rayleigh on Breguet B3, and Airship "Gamma," with four passengers, left for Salisbury and arrived without incident, except Major Moss, who had to come down at Wootton owing to engine trouble. Airship "Gamma" arrived back in the afternoon. Major Burke started return journey, but had to come down at Crookham owing to lack of fuel.

Capt. Rayleigh on Breguet B 3 arrived Saturday back from Salisbury, making good time. Major Burke arrived from Crookham



The new Short twin-engined triple-tractor biplane. General view distinctly showing the position of the three tractor screws.



Engineer Lieut. Briggs, R.N., with Leading Seaman Russell, on Short biplane No. 34, upon which he took his pilot's certificate on July 27th.

after having undercarriage repaired through landing on rough ground. In the evening two fine flights by Capt. Rayleigh on Breguet B 3.

Monday, Lieut. Longcroft on BE 1 several circuits; later Major Burke on BE 1, Capt. Rayleigh on Breguet B 3, and airship "Gamma" left for Salisbury again, all arriving safely. Raynham flew new Flanders monoplane over from Brooklands; later out doing War Office tests. In the hours' test had to make hurried descent, owing to lack of petrol. In the rolling test got on to some very rough ground and broke undercarriage, and machine had to be dismantled.

Filey School (Blackburn Aeroplane Co.).

ON Friday last week Brereton did some successful flying at Wem on his Blackburn monoplane. He gave an exhibition at the Wem and District Agricultural Show, and although the weather was rather gusty he was able to satisfy the large crowd who had gathered to witness the flights.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Weather at Hendon nearly as bad as everywhere else, so not much done past week.

Wednesday, school out at 7.10 p.m., when Mr. Wynne made his first solo straights; then Lieut. Stopford out for solo straights, followed by Mr. Hoelscher, who was doing straights with Mr. Blackburn.

School out Thursday morning for two hours. Mr. Wynne straights on Sommer, followed by Lieut. Stopford. Then Mr. Wilson up for straights with Mr. Blackburn, followed by Lieut. Allen, who afterwards made some solos. Then Mr. Kinhardt out for straights (also with Mr. Blackburn), after which the wind got up too high for further work.

School out Friday evening. Mr. Wynne doing straights on Sommer, followed by Mr. Fuller; then Mr. Wilson out with Mr. Blackburn, followed by Capt. Halahan. Mr. Turner up with passenger, after which Lieut. Allen out for a straight.

School opened Sunday at 5.10, Lieut. Allen taking out the Sommer for straights, followed by Lieut. Stopford. Mr. Wynne made some circuits, showing excellent form. Unfortunately he burst a tyre on landing, causing half an hour's delay. Mr. Wilson (new pupil) followed with straights, with Mr. Blackburn behind him, and then Lieuts. Allen and Stopford had a second lesson, and Mr. Marrick went for his first trial, with Mr. Blackburn, followed by Mr. Wynne, who, as the wind was getting up, only attempted straights.

Blériot School.—Owing to the Bank Holiday meeting no school work possible. Tuesday, too wet and windy for practice, and Wednesday morning the wind was too strong for pupils and continued so all day and evening. In the evening Mr. Metford tried out LB 3 after adjustments and found slight alterations necessary.

Mr. Metford had LB 3 out Thursday for test before handing over to pupils and found engine pulling very well. Machine was then handed over to Mr. Sacchi for a straight, followed by Mr. Welburn on same machine. Mr. Clappen took over machine after and did a straight flight at about 15 ft., experiencing some difficulty in making a good landing, with the result that the chassis suffered somewhat on touching *terra firma*. M. Gandillon meanwhile did a roll on LB 1, with tail well up. Mr. Hart out early Friday on LB 2, and eventually returned machine to sheds suffering from buckled wheel. Saturday, M. Gaudillon did a very good roll on LB 1, with the tail well up, almost ready to be promoted to LB 2 for straights.

Mr. Reilly was also out early, but wind unfortunately rose before he could do any practice.

W. H. Ewen School.—After several days bad weather, conditions improved on Thursday last week, and the pupils were hard at work at 5 a.m. Capt. O'Brien was rolling well and Messrs. Ware, Apar, Edmund, H. James and J. H. James were doing some good straight flights. On Friday evening Capt. O'Brien was making good progress hopping and also Mr. H. James, while Messrs. J. H. James and Ware were doing good straights and half circles. After Pilot Dubois had made a short flight on one of the *brevet* machines, M. Baumann flew the first half of his figure eights for his *brevet*, attracting attention by his steady flying and nicely banked turns. On Saturday M. Baumann was again flying and passed his height test. Mounting to over 200 ft. he stopped his engine and made a beautiful *vol plané* and landing. Messrs. H. James, J. H. James, Apar, Ware and Capt. O'Brien got in some good flying practice. On Sunday Messrs. Edmund and Gist were out early, and, the morning being unexpectedly fine, had the field to themselves and put in some splendid practice. During the day M. Marty, chief pilot of the Caudron School made three beautiful flights on the 60-h.p. two-seater

Caudron. In each flight he rose to over 3,000 ft. M. Marty's clever flying attracted wide attention, and the speed and gliding power of the biplane singled her out for observation, which resulted in a great demand for passenger flights. On Monday the pupils were again getting in some good practice, and Messrs. James, Edmund and Capt. O'Brien were flying well. Mr. Sutton was on the *brevet* machine later.

Salisbury Plain.

Royal Flying Corps.—In the evening of Tuesday week Major Brooke-Popham was first out on the Avro followed by Capt. Hamilton on the Deperdussin who was flying high. Lieut. Hartree made three high flights on F 1, one with a passenger and the other two solos. On landing he handed the machine over to Lieut. Fox who did some fine banking and spirals. Afterwards Lieut. Porter, Victor Strugnell, Serjt. Ridd, and Private McCudden all had one flight on this 'bus, Strugnell finishing the evening's work with a high flight, with right and left-hand turns. No flying on Wednesday morning, but in the evening Capt. Hamilton tested the Deperdussin mono. and then made several flights with passengers. Next out was Major Brooke-Popham on the Avro, doing some scouting work round the Plains. Strugnell was up to 800 ft. on F 1. Lieuts. Porter, Hartree and Fox each made three flights on F 7, which was put out of commission by the last-named landing heavily and breaking some stays.

Major Brooke-Popham finished the evening's work with a very high flight. Work on Thursday was confined to cleaning and tuning up engines in the hangars. On Friday morning Capt. Hamilton made several circuits on the Deperdussin, followed by Lieut. Hartree on biplane F 7. Lieut. Fox, Private McCudden, and Serjt. Ridd were also out on F 7. Barrington-Kennett went for a long trip with a passenger on the Nieuport B 4, and Major Brooke-Popham made one flight on the Avro. Strugnell rounded off the morning's work. At 9.15 a.m. the army airship "Gamma" arrived from Farnborough with four on board, and she was away again at 12.45 p.m. In the evening Capt. Hamilton made three flights, Lieut. Hartree two, Lieut. Fox four, McCudden one, Strugnell two, Serjt. Ridd two flights, all on the biplane F 7. Lieut. Conner made a trip on the Nieuport B 4, and Capt. Beor was flying BE 4 at a good height with passengers. Major Burke flew back to Farnborough on BE 1. Major Brooke-Popham made two trials on the Avro biplane. Capt. Wadham made a very high flight on biplane F 1, and then work had to be stopped owing to rain.

On Saturday morning Capt. Hamilton was flying the Deperdussin and Major Brooke-Popham the Avro. Strugnell, Serjeant Ridd, Lieut. Porter, Lieut. Hartree, and McCudden were practising, and Lieut. Conner was up very high on the Nieuport monoplane B 4. The mechanics were busy erecting the new Bristol monoplane.

In the evening Capt. Hamilton had the Deperdussin out, and made several flights. Next out was BE 3, piloted by Capt. Beor.

No flying on Sunday, but on Monday morning Capt. Hamilton and Major Brooke-Popham were at work as usual, and Capt. Beor was practising on BE 3. Another early morning visit was paid by the "Gamma" from Farnborough and she left again at 2.10 in the teeth of a very strong wind. The B 3 arrived from Farnborough at 7.28, and the BE 1 at 8.11, piloted by Capt. Burke. The BE 1, BE 2, BE 3, H. Farman and Avro machines were all out, as well as Capt. Hamilton on Deperdussin.

Upavon (Central Flying Schol).

VERY unfavourable weather was experienced during the past week, and only on one day was flying permissible. On Friday morning early Lieut Longmore, R.N., set the ball rolling by a flight on Short 44, with Staff-Serjt. Thomas as passenger. Capt. Fulton made three short solos on the Avro. The Short 43 was the next machine out, with Capt. Gerrard, R.M.L.I., as pilot, and Capt. Cordner, R.A.M.C., in the passenger's seat. Lieut. Longmore then made another flight with Lieut. O'Connor, followed by one with Staff-Serjt. Thomas for tuition. Capt. Fulton, R.F.A., made several short flights, carrying A.M.'s Hodgson and Higginbottom alternately. On his return, S.-Serjt. Thomas qualified for his *brevet* on Short 44. Capt. Gerrard made two flights, taking first Asst.-Paymaster Lidderdale, and later, A. M. Barker as

passengers. Capt. Fulton made three more short flights on the Avro with Asst.-Paymaster Lidderdale, A. M. Harrison and A. M. Hodgson. Lieut.-Col. Cook in the interim took out the Avro for a flight of about 15 minutes' duration.

In the evening Lieut. Randall, on Short 44, was the first out. Lieut.-Col. Cook flew the Avro to Lee-on-Solent, two or three of the mechanics of the school following by road. Lieut. Longmore took out Short 44 with O'Connor first and A. M. McNamara after as passengers.

During the evening Capts. Fulton and Broke-Smith motored over to Larkhill to bring two more machines to the school. Capt. Fulton was the first back on another Avro biplane, this being the third at the school. Capt. Broke-Smith arrived shortly afterwards on Bristol F 7, two machines of this type being over here now.

No flying was done on Saturday.

BRITISH NOTES

THE ROYAL FLYING CORPS.

FROM the *London Gazette* of August 9th:—

Special Reserve of Officers. Royal Flying Corps. Military Wing.—Robert R. S. Barry to be Second Lieut. (on probation), August 10th, 1912.

A British Height Record.

ON Monday at Salisbury Plain, Mr. de Havilland on one of the biplanes designed and built at the Royal Aircraft Factory considerably improved on the British height record, which has stood at 9,000 ft. since M. Salmet's flight of last November. Mr. de Havilland, however, in the course of a three hour trip went up to 9,500 ft., and was withal accompanied by a passenger, Major F. H. Sykes. The aviators lost their way in the clouds and picked up their bearings at Newbury, Berks, from whence they were able to return to Salisbury Plain. This feat, which is a British record for altitude both with and without passenger, is further referred to elsewhere in this issue.

By Hydro-aeroplane up the Thames.

ALTHOUGH London was deprived by the appalling weather of the sight of M. Beaumont piloting his hydro-aeroplane up the Thames, the visit of Mr. F. K. McClean more than compensated for the loss. Remembering an appointment in town on Saturday morning, Mr. McClean thought it would be a good idea to come up on his Short machine, and so at 6 a.m. he had it brought out of its shed at Harty Ferry, in the Isle of Sheppey, and after seeing everything in order he started off. Following the coast round Leysdown, Warden Point to Sheerness, he continued over the Thames. At Gravesend the smoke of the various factories rather troubled the aviator but he made good progress. Approaching London Mr. McClean brought his machine lower down and negotiated the Tower Bridge between the lower and upper spans, but the remaining bridges to Westminster he flew underneath, the water being just touched at Blackfriars and Waterloo bridges. He reached Westminster about 8.30 and was taken ashore to Westminster Pier on a Port of London Launch.

The return journey on Sunday afternoon was not so successful owing to restrictions as to rising from the water which had been imposed by the police. The bridges had all been safely negotiated, and when near Shadwell Basin Mr. McClean started to manoeuvre to get into the air at the point designated by the river authorities. He had made one circuit when the machine side-slipped, and either through hitting a barge or by sudden contact with the water one of the floats was damaged. The machine was then towed into Shadwell Dock, this operation being superintended by Mr. McClean from the driving seat, and dismantled for its return by road to Eastchurch.

Disaster Overtakes M. Beaumont.

AFTER waiting for several days at Berons, a suburb six miles west of Paris, "Beaumont," otherwise Capt. Conneau, was able to make a start for London on the 9th inst. His Donnet-Leveque hydro-aeroplane was wheeled down to the water, and at 4.30 a.m. it rose from the Seine for a trial run. Everything was working in good order, so the pilot did not return but set his course along the Seine for Havre. Passing Meulan, Mantes, Vernon, Gaillon and Caudebec, the machine reached Quillebeuf at 6.40, where a stop was made for replenishments. A quarter of an hour later it was in the air again, and Havre was reached at five minutes to nine, the machine alighting in front of the Casino. The mechanics, hearing of the stop at Quillebeuf, had gone there, so that M. Beaumont had to rely on amateur help at Havre. Some slight damage was done through the machine colliding with the shore, but everything was in order after lunch when at 2 p.m. a re-start was made for Boulogne, to which a non-stop run of 1 hr. and 55 mins., without the slightest incident, ensued.

OF THE WEEK.

At Boulogne the enthusiastic fishermen came out to render what assistance they could, but their zealous but unprofessional efforts only resulted in one of the floats being damaged, so that no further progress could be made that day. Repairs were, however, executed over night and on Saturday afternoon M. Beaumont prepared for the cross-Channel trip. The wind buffeted the machine very considerably and after making a circuit the pilot had to bring his machine down to the water, which was very choppy. Suddenly the biplane was caught by a very strong squall and completely overturned. The pilot was able to swim clear and superintended the towing of the wrecked machine back to the shore. It is to be repaired and M. Beaumont will then make another attempt to fly to London.

Mr. Slack's 1,000 Miles Tour Concluded.

ON Sunday afternoon *habitués* of Hendon were rather a little exercised to see a strange monoplane approaching. It turned out to be Mr. Robert Slack, on his I.C.S. Blériot monoplane, who had flown over from Rugby by way of concluding his 1,000 miles flying tour round England on behalf of the International Correspondence Schools. He had covered the 70 miles from Rugby in 60 mins. and thus carried out what the I.C.S. undertook to do when he was sent off from Hendon in June. The machine seemed to be little the worse for its arduous work of the past few weeks.



Mr. Robert Slack, the I.C.S. pilot, in front of his Blériot machine, upon which he on Sunday completed at Hendon his 1,000 miles tour through the Midlands.

An Appeal.

BEING informed that Mrs. Campbell—widow of Lindsay Campbell, the Australian aviator who lately lost his life at Brooklands—has been left in destitute circumstances, Col. H. S. Massy appeals to all who are interested in aviation to subscribe to a fund of which Col. Massy is willing to act as treasurer. We are informed that the High Commissioner for Australia has cabled to his Government for a free passage for Mrs. Campbell and her children; but she has been left in a most unfortunate position otherwise, and is sadly in need of immediate pecuniary assistance. All subscriptions will be gladly acknowledged by Col. Massy, Coventry House, Coventry Street, W.; or, care of the Editor of FLIGHT, 44, St. Martin's Lane, W.C.

Aeronautics at the Autumn Manœuvres.

FOR the accommodation of the officers and men of the Royal Flying Corps and the thirty aeroplanes and two airships which are to take part in the autumn manœuvres a special camp has been arranged at Wallingford.

The Million Shilling Fund.

OVER 300 Lord Mayors, Mayors and Chairmen of Councils in various parts of the country have already agreed to act as local hon. treasurers for the million shilling fund of the Aerial League, which is meeting with a good response. It is a significant fact that a sum of £1 8s. has been received from a small band of British and Native officers at Kaira, Bombay, who could only have been made aware of the scheme by telegrams in the local Press from England.

The Daily Mail Demonstrations.

IN spite of the changeable weather some very fine flying was done by the different aviators engaged by the *Daily Mail* in various parts of the country last week. On the 7th, M. Salmel on his Blériot flew from Southend to Clacton, and gave a series of very fine

flights there, while Mr. Hamel, also on a Blériot, did some good flying at Douglas, and later in the day at Port Erin. M. Hubert also put in a couple of trips on the Farman hydro-aeroplane at Torquay. The next day, M. Salmel did some good exhibition work at Clacton, while Mr. Hamel returned to Douglas, and was presented with a gold cigarette case as a souvenir. At Cowes both Mr. Grahame-White and Mr. Travers made trips on their hydro-aeroplanes, while on the following day among the passengers carried by the former was the Duchess of Westminster. In the Isle of Man, Mr. Hamel, on the 9th, went from Douglas to Castletown, and went back after giving an exhibition flight. On Saturday, M. Salmel flew on to Felixstowe and Ipswich, while Mr. Hucks went on to Norwich from Gorleston. Mr. Grahame-White took some passengers, among them Sir Thomas Lipton, for trips over Southampton Water and the neighbourhood. On Monday, some good flights were made at Weston-super-Mare by M. Fischer and M. Hubert, and M. Salmel flew over from Ipswich to Gravesend later in the evening, passing over Manningtree, Colchester, Maldon and Pitsea on the way. On Tuesday, he went on to Ramsgate and then back to Broadstairs, a stop being made at Herne Bay, and circled over Margate and Ramsgate.

Mr. Spencer in Dorset.

A POPULAR feature at the Conservative fête at Sherborne, Dorset, on August 5th, was an exhibition flight of a quarter of an hour's duration by Mr. Herbert Spencer on his biplane. The flight was greatly appreciated by the 10,000 or so people present. In landing Mr. Spencer had the misfortune to break one or two struts.

An Aeroplane at Auction.

INCLUDED in an auction sale at an engineering works at Cardiff on Monday last was a 35-40-h.p. Modeler two-seated monoplane, and it eventually found a purchaser at £10—presumably without the engine.

FOREIGN AVIATION NEWS.

The Paris-Berlin Flight.

ALTHOUGH Brindejonc-des-Moulinais did not succeed in getting to Berlin in his attempt for the fourth Pommery prize on the 8th inst., he put up a splendid flight on his Morane monoplane, fitted with Chauviere-Integral propeller, as the weather was very stormy. Soon after leaving Villacoublay at five minutes to five he ran into a lot of clouds, which compelled him to keep very low, while the wind was very strong. He, however, made a fine flight to Rheims, which was reached at 5.50. After replenishing, which took 25 minutes, he was away again, heading for the frontier. This was passed at Mezieres, and at 8.46 (French time) a landing was made at Bonn, after a stop at Metheim near Cologne to check his direction. Leaving Bonn at 10 o'clock he ran into a bad storm, and was forced down by the pouring rain after an hour's flight at Attendorn. In landing, the machine collided with a tree, and the propeller was smashed as well as other slight damage. The machine has been

sent back to Paris, and after being repaired another attempt will be made.

Delivering a Caudron by Air.

GASTON CAUDRON on the 7th delivered at St. Cyr a new Caudron biplane for Commander Felix. The journey of 160 kiloms. from Crotoy took an hour and a half, and the average altitude was 1,200 metres.

Another Superior R.E.P. Pilot.

ON the 7th inst. Lieut. Brugniere, who had previously made his first trial from Buc to Troyes and back, made his second test for a superior *brevet* on a R.E.P. monoplane over a course from Buc to Dreux, Orleans and back.

Good Work at Farman School.

AT Mourmelon on the 7th, Lieut. Mailfert on a Farman biplane of 17 metres span, with a useful load of 425 kilogs. on board, went up 1,200 metres in 7 minutes. On the following day Sapper Seguin on a 70-h.p. *petit* Farman was flying at 3,100 metres for an hour and a half, and on Friday Lieut. Mailfert did a one-hour flight on a 100-h.p. machine.

A Round Trip on a Nieuport.

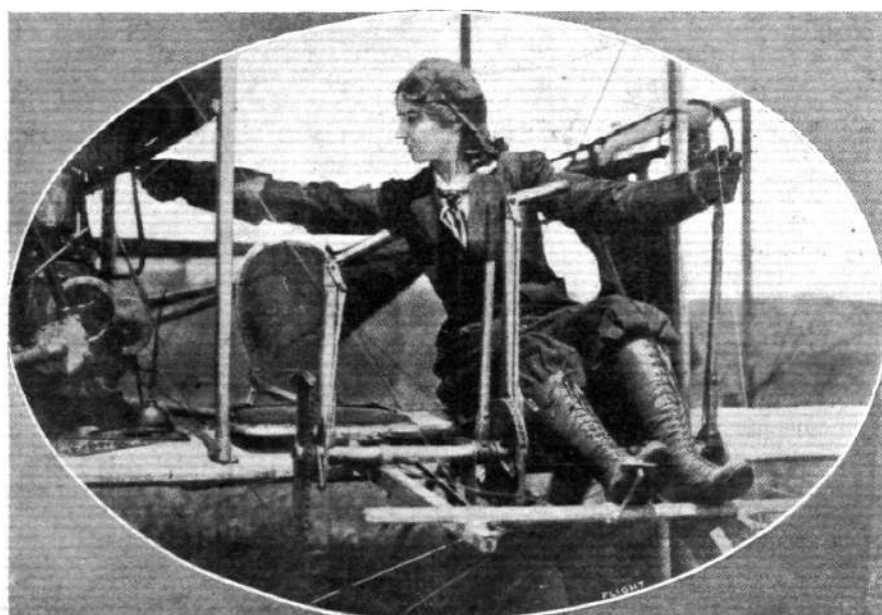
STARTING from Buoy on 7th inst. on his Nieuport, accompanied by his mechanic *chef pilote* Barillon went to Pagny-sur-Sceaux, Bar-sur-Aube, Brenne-le-Chateau, Vassy, St. Dizier, and back to Mourmelon, after having made fifteen calls in the country on the way.

New Superior Farman Pilots.

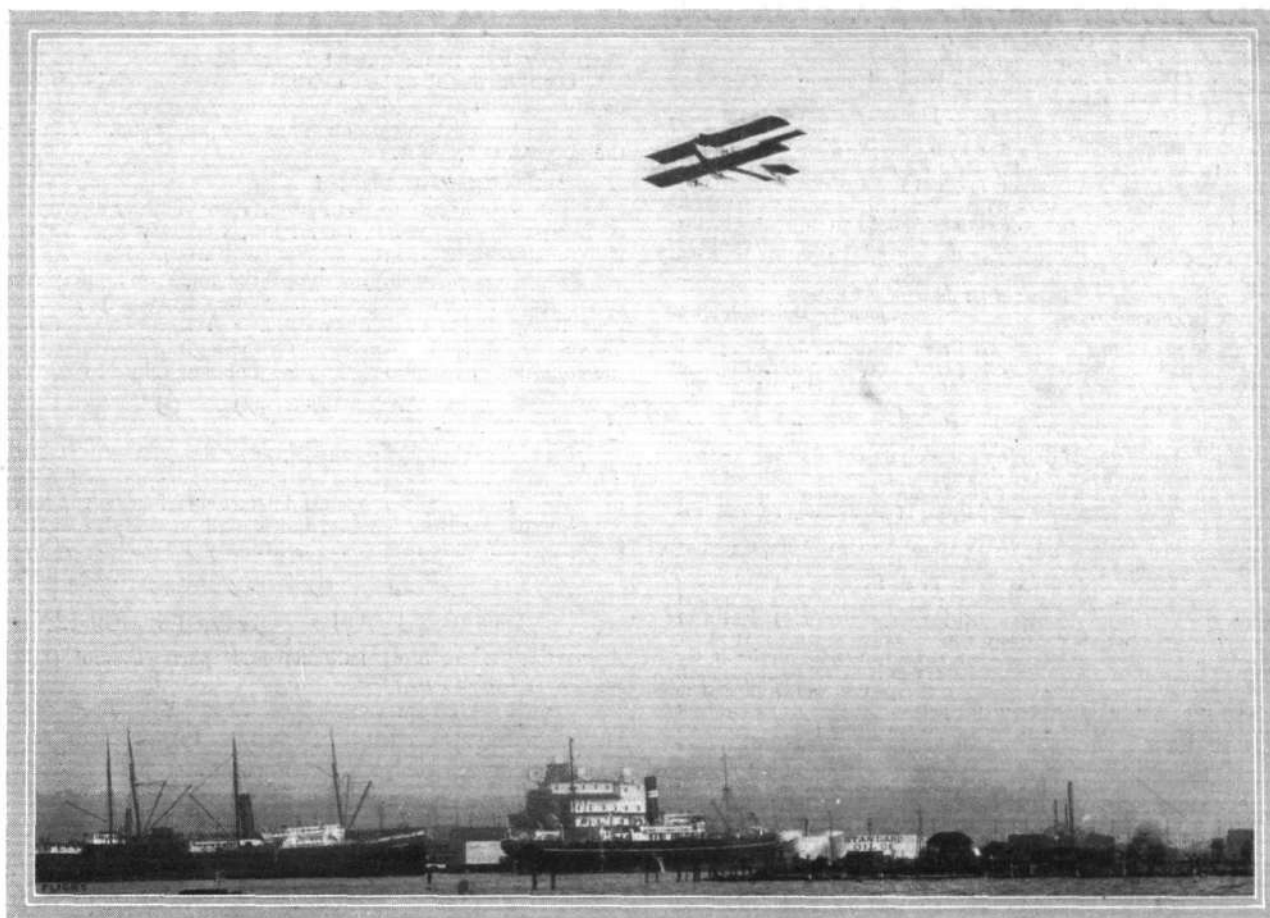
FROM the Farman school at Rheims on the 7th inst. Lieuts. Pierra, Vigne and Menand made long reconnaissances over the line from Rheims to Epervan, and non-commissioned officer Guiton made a test for a special military over the Rheims, Mailly Camp, St. Menesould, Rheims course. He made another test on Saturday last flying to Amiens and back. On the 8th inst. Lieut. Cesani made a test from Buc to Orleans and Chalons, Lieut. Loubignac one from Buc to Rheims, and Sapper Foulquier one from Chalons to Juvisy and back.

Rheims to St. Cyr on a Hanriot.

ON the 7th inst., Lieut. Germain flew in splendid fashion on his Hanriot monoplane from Rheims to St. Cyr. He returned to Rheims on the following day.



Miss Katherine Stinson, a lady pilot who recently obtained her *brevet* in America at Cicero Field, where she passed for her certificate on a Wright biplane.



Capt. James V. Martin, one time associated with the Grahame-White School, in his latest Martin type tractor biplane, over Seattle Harbour, U.S.A., July 2nd last. The above photograph has reached us from Mr. Martin with kind regards from himself and Mrs. Martin.

Long Excursion on a Blériot.

LEAVING Pont Leroy on his Blériot at 8.48 a.m. on the 9th inst. Giraud passed Tours at 9.15 and landed at Breil. He was on the wing again at 10.9, and following the Loire, landed at Angers half an hour later after a détour about Bouchemaine.

Cross-Country on a Blériot.

ON the 9th inst. Serjt. Laurent with Lieut. Gionnes left Pau on his Blériot at 5 a.m., and landed at St. Paul-les-Dax at 6.5. He later returned to Pau, and repeated this 200 kilom. trip last Saturday. Both counted for a superior *brevet*.

Duchess of Aosta in a Maurice Farman.

ON the 9th inst. Mr. Maurice Farman took the Duchess of Aosta for a trip on a M. Farman biplane ordered by the Italian Government.

Cross-Country Work on M. Farman Machines.

FROM Buc Lieut. Vitrat flew to Mailly camp on his Maurice Farman biplane on the 9th inst. in 1 hour 20 mins., while Lieut. Varcin went over to St. Cyr and then went on to Chalons camp. On Saturday Lieut. Coville and Sapper Malherbe landed at Amiens from Villers-Cotterets, and later left for Crotoy.

Good Work with the Train.

ON Saturday at Mourmelon Labarre made a flight of an hour on a Train monoplane at a height of between 900 and 1,000 metres, and Raoul Garros was practising. M. Train was flying at a height of 1,000 metres.

Testing the R.E.P. Hydro-aeroplane.

AT Meulan on the 12th inst., Molla was testing one of the new R.E.P. hydro-aeroplanes built to take part in the forthcoming A.C.F. competition at St. Malo. It rose from the Seine in 60 metres and was unofficially timed to be flying at a speed of 120 k.p.h.

Cross-Country on Clement-Bayard Monoplane.

ON Saturday last Gastinger, on his all-steel Clement-Bayard monoplane, decided to make a surprise visit to London, but the heavy rain upset his calculations. He left Issy at 4.30 a.m. and landed at Amiens at 5.45. From there he was on the wing again at 8 o'clock, and after 35 minutes' flying reached Crotoy safely. There, however, rain put a period to the proceedings, and Gastinger had to postpone his excursion to England.

Flying Against Wind on a Blériot.

LEAVING Vittel at 8 a.m. on his Blériot monoplane on the 8th inst., Lieut. Bellemois flew over to Troyes, but had to fight against the wind all the way. This is shown by the fact that it took 2 hrs. 50 mins. for the distance of 150 kiloms. Two days later he flew to Etampes, and this time a journey of 150 kiloms. only took an hour and a-half.

The Michelin Target Prizes.

FINAL trials for one of the Michelin target prizes were made on Saturday and Sunday last. For the prize of £1,000 the competitors had to drop from a height of 800 metres as many as possible of fifteen missiles on to a target 40 metres by 170 metres representing a dirigible shed. On Saturday, the *remous* were very bad, and neither Lieut. Bousquet nor Lieut. Lucca on Farman machines succeeded in hitting the target. On Sunday morning, one competitor made a trial, but owing to the clouds could not work higher than 300 metres, from which he got a dozen shots on to the target. This, however, did not count for the prize, being too low. Later, Lieuts. Bettini, Mailfert, and Varcin on Farman machines, and Gaubert on Astra-Wright, with the Scott bomb-dropper, made trials, and Gaubert in a 50 mins. flight got eight missiles on the target from heights of 800 to 820 metres. Subject to official verification, this was awarded the prize. Lieut. Bousquet scored five shots from 900 metres, and Lieut. Varcin six.

Greeting from Mr. and Mrs. J. V. Martin.

It will be remembered that when the fatal accident to "Miss" Julia Clark, at Chicago, on June 17 was reported in London, and it was stated that the unfortunate aviatrix was Mrs. J. V. Martin, we ventured to suggest that a mistake had been made, but by all we were voted wrong. All doubt on the point is, however, now set at rest by a photograph, which we reproduce, taken on July 2, at Seattle, showing Mr. Martin flying well on his Martin-Queen biplane, and sent to FLIGHT, with "aerial greetings from Mr. and Mrs. J. V. Martin."

Messages from Aeroplanes by Dictaphone.

SOME tests were carried out in France the other day with a dictaphone fitted to M. Bernard's Farman biplane. During a flight the passenger dictated his observations into the machine, the disc was thrown to the ground, and the record reproduced. The tests were watched for the French Army by Col. Etienne.

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Hand-launched	{ Distance ...	A. E. Woollard ...	477 yards.
	{ Duration ...	A. F. Houlberg ...	89 secs.
Off ground	{ Distance ...	F. W. Jannaway ...	84 yards.
	{ Duration ...	G. Rowlands ...	30 secs.

Hydro-Aeroplane Competition.—The first hydro-aeroplane competition to be held in England took place on Saturday 10th, on the Welsh Harp Water, Hendon. It was a very successful contest, 19 out of 25 competitors who entered competed. The judges were Messrs. T. W. K. Clarke, A.F.Ae.S.; H. S. Lloyd, A.F.Ae.S., and W. Akehurst (Hon. Sec.). Prizes: 1st, £5 5s. (presented by the Royal Aero Club) and certificate of the Association; 2nd, £3 and certificate of the Association (presented by the Association); 3rd, £1 and certificate of the Association (presented by the Association). Maximum marks 100—75 for duration; 25 for alighting on water. Result of 1st six were as follows:—

Place.	Competitor.	Machine.	Duration. Mks.
1	G. P. Bragg-Smith ...	Bragg-Smith Bi. ...	21'2 90½
2	R. Stedman (Aerial Engineering Works)	Aerial B 20 Bi. ...	16'8 72½
3	W. J. Williams ...	The Dragon Fly Mo. ...	13'4 70
4	Mingsin Kwei ...	M.S. Bi. ...	12'2 67½
5	H. Bate ...	Trcto (1-2-P2) ...	11 48
6	P. K. Johnson ...	Monoplane ...	10 43

The duration timed from time of rising off water till time of alighting on water. The next official trials will be held at the Welsh Harp, Hendon, on August 31st, after the Hydro Competition, and will be for hydro-aeroplanes only. This being the first trial of hydro-aeroplanes for the purpose of establishing records, it is hoped that there will be a good entry.

Competitions.—Model Competition, Welsh Harp, Hendon, August 31st, at 3 o'clock. Entries close first post August 24th. For hydro-aeroplanes rising off and alighting on the water. Open to the world. Prizes: 1st, £3 and certificate; 2nd, £2 and certificate; 3rd, £1 and certificate; all presented by the Kite and Model Aeroplane Association. Tests: A. Rising off water. B. Duration of flight. C. Landing on water after a free flight. Maximum marks 100: 75 for duration, 25 for alighting on water. Rules: 1. Competitors must be at the judges' flag at 2.45. Any competitor not present at that time will be disqualified. 2. Models must not weigh less than 4 ounces. 3. Competitors will be allowed to make reasonable repairs at the discretion of the judges. 4. Competitors will not be allowed to replace any part without the permission of the judges. 5. Each competitor is entitled to three trials. 6. All competitors must launch their machines in the same direction. 7. In the event of a competitor's machine not alighting on the water in the course of test A, an additional hand-launched flight will be allowed in test C in each case. If less than five starters the 3rd prize will be withheld.

27, Victory Road, Wimbledon.

W. H. AKEHURST, Hon. Sec.

Models, Club Notices, &c., are held over owing to the great pressure on our columns occasioned by the report of the Army Trials.

Mr. Frederick R. Simms Back in England.

WE learn from the Simms Magneto Co., Ltd., that Mr. Frederick R. Simms has just arrived from the United States, per the ss. "Olympic," and that he expects to remain in England for upwards of a couple of months, in order to give personal attention to the developments of the Simms Magneto Co. in this country.

An Exciting Experience.

MR. BODDY, the managing director of the "Boddy" Life-Saving Jacket Co., to whose safety appliance we recently called attention in these columns, met with a curious experience during Cowes week when demonstrating to the yachting folk the advantages of his jacket. Two assistants were engaged to demonstrate its ability to support three in the water, and the three of them, after showing its virtues to the people on the yachts near shore, rowed out to some of the craft more distant to continue their demonstrations. After one demonstration, the party were struck by a heavy rain squall, and the assistants clambered back into the boat, leaving Mr. Boddy in the water. Knowing him to be perfectly safe, they made for temporary shelter and after a little while proceeded to shore. Meanwhile Mr. Boddy went comfortably drifting along the line of yachts, and the folk on board, noticing him in the water, regarded the whole thing as a very clever way of showing off the virtues of his appliance. They did not therefore make any attempt to assist him. In this way he drifted on and on till he passed the yachts and was left alone with the sea, the rain and the wind. After about an hour of this Mr. Boddy thought the thing was getting slightly beyond a joke, for he was drifting rapidly towards the open sea. He knew he could never drown, but there was the prospect of being starved, as he only had enough provision with him to last him for two days. Besides, the rain and the rough sea made things none too comfortable. Eventually, the situation being realised, a fast motor launch came to his rescue, and he was landed close to the Grahame-White waterplane hangar, none the worse for an experience which conclusively proved the value of his appliance. During the past week or two the papers have brought to the public notice numerous instances in which, had the victims been equipped with life-saving jackets, many lives would have been saved. As he points out, for those who have anything to do with the sea, it is not a sufficient guarantee of safety that they are able to swim. Lifeboatmen never venture out without their cork jackets, although they are one and all hardy seamen. Why, therefore, should people, especially those who fly waterplanes, who have not had such lengthy experience of the sea, venture out without availing themselves of a similar type of safeguard?

AIRSHIP NEWS.

Artillery Practice Against Aircraft.

UNDER special orders a series of experiments in shooting at a captive balloon attached to a motor lorry were to have been carried out at the Larkhill ranges on Thursday afternoon. The height of the target was 1,000 ft.

The "Gamma" Marooned.

WHEN returning to Farnborough on Monday after the second of her excursions to Salisbury Plain, the army airship "Gamma" had to struggle against a strong head wind. Near Andover the wind freshened to 40 m.p.h. and in the hope of finding conditions easier the altitude was decreased. It was a vain hope, however, and near Long Parish a landing was effected behind a screen of trees. There the airship was anchored for the night and also the next day, the conditions being too rough for immediate return to Farnborough.

Cellon.

THE Austrian Government, after experimenting with other dopes, have now specified that Cellon is to be used on all their machines, as they find it has no deleterious effect on the fabric.

Cellon is now British made, and is used on Cody's machine which is giving such good results at the Military Trials.

IMPORTS AND EXPORTS, 1911-12.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910):—

	Imports.		Exports.		Re-Exportation.	
	1911.	1912.	1911.	1912.	1911.	1912.
January ...	1,196	619	1,088	2,412	Nil	Nil
February ...	3,129	3,110	1,786	36	Nil	Nil
March ...	11,327	640	1,027	950	357	600
April ...	2,110	4,820	807	72	4,343	50
May ...	1,707	7,494	2,471	1,350	1,972	154
June ...	3,225	7,928	2,432	419	1,682	300
July ...	9,822	13,794	2,256	5,376	643	967
7 months	32,516	38,405	11,867	10,615	8,997	2,071

Aeronautical Patents Published.

Applied for in 1911.

Published August 15th, 1912.

17,033. J. A. BLONDIN. Flying-machines.

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